

The Engineering index annual for ...

American Society
of Mechanical
Engineers

Library
of the
University of Wisconsin

THIRTIETH YEAR

THE
ENGINEERING INDEX
ANNUAL
FOR
1913

COMPILED FROM THE ENGINEERING INDEX PUBLISHED MONTHLY
IN THE ENGINEERING MAGAZINE DURING 1913



NEW YORK
THE ENGINEERING MAGAZINE CO.

1914

COPYRIGHT, 1914
BY
THE ENGINEERING MAGAZINE CO.

181941
FEB 17 1914

AI
E 3
12

TO THE USER

WITH this volume of THE ENGINEERING INDEX—the twelfth since the work was first undertaken and the eighth since it assumed the “Annual” form—a continuous index to the engineering and technical literature of the past thirty years is made available to the reader. And in this book, as in the Annual volumes previously issued, the “classified” system of arranging the items is followed in place of the “strict alphabetic” order of the earlier volumes. In other words, the articles indexed are first grouped under the great divisions of engineering practice to which they belong—Civil, Mechanical, Electrical, Mining, etc.—and under these again they are sub-grouped according to the recognized special divisions of each field. After these two steps have been taken in sorting the miscellaneous literature of the day into closely related sections, the final arrangement under each section becomes strictly alphabetical.

In THE ENGINEERING INDEX ANNUAL for 1913, herewith presented, the Classification of the Index on page 7 not only gives the main and sub-heads of the classified arrangement, but lists in addition every catch-word, with its page reference, so that a full outline of the entire contents is given in a highly condensed form, and by running his eyes over this topical list the reader may save much of the time that might be spent searching the pages of the book itself.

Serial articles are indexed upon the appearance of the first installment only, thus giving the searcher the clue by which the succeeding articles can be found. This rule has been waived in some instances of articles in two or three installments, which are indexed entire.

The INDEX comprises about two hundred and fifty publications, representing seventeen nations and colonies and six languages. About three-fourths of these journals are printed in English, the others being in German, French, Spanish, Italian and Dutch. With every entry a brief descriptive note is given defining the scope and purport of the articles, in many cases sufficient for the purpose of the investigator and saving him the labor of further search. In general, however, the INDEX is used as a guide to the otherwise overwhelming mass of information contained in the huge files of the engineering periodicals stacked on the shelves of reference libraries throughout the world.

The work as a whole represents the continuation of that originally started by the late Professor J. B. Johnson in the journal of the Association of Engineering Societies in 1884, and turned over by that association to THE ENGINEERING MAGAZINE at the close of 1895. The previous volumes, published in 1892, 1896, 1901, 1906, 1907, 1908, 1909, 1910, 1911, 1912 and 1913, respectively, covered with increasing fulness and thoroughness the field of periodical literature in engineering and closely related applied sciences. This latest volume brings the investigator down to the December, 1913, monthly part of THE ENGINEERING INDEX, covering the serial literature of engineering up to October, 1913, while the earlier parts enable searches such as occur in patent cases and the like to be prosecuted with a minimum of cost and delay.

REFERENCE LIST OF PERIODICALS

Alphabetical List of Periodicals Indexed in Order of their Abbreviations

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
All Indus	Alliance Industrielle	12	Brussels
Am Arch	American Architect	52	New York
Am Engr	American Engineer	12	New York
Am Gas Light Jour	American Gas Light Journal	52	New York
Am Inst of Archts	American Institute of Architects	Irreg.	New York
Am Jour Pub Health	American Journal of Public Health	12	New York
Am Jour Sci	American Journal of Science	12	New Haven
Am Rev of Revs	American Review of Reviews	12	New York
Ann d Ponts et Chauss	Annales des Ponts et Chaussées	12	Paris
Ann della Soc d Ing e d Arch Ital	Annali della Società degli Ingegneri e degli Architetti Italiani	24	Rome
Ap Sci	Applied Science	12	Toronto
Arch Rec	Architectural Record	12	New York
Arch Rev	Architectural Review	12	Boston
Arch't	Architect	52	London
Arch't & Build	Architecture and Building	12	New York
Aust in Stand	Australian Mining Standard	52	Melbourne
Autocar	Autocar	52	Coventry, Eng.
Auto Jour	Automotor Journal	52	London
Automobile	Automobile	52	New York
Auto Rund	Automobil-Rundschau	24	Berlin
B. C. Min & Engng Rec	British Columbia Mining and Engineering Record	12	Vancouver, B.C.
Beton u Eisen	Beton und Eisen	20	Vienna
Boiler Maker	Boiler Maker	12	New York
Brass Wld	Brass World	12	Bridgeport
Br Build	Brick Builder	12	Boston
Br Engrs Club	Brooklyn Engineers Club	1	New York
Builder	Builder	52	London
Bull Am Inst Min Engrs	Bulletin of the American Institute of Mining Engineers	12	New York
Bull Am Ir & St Assn	Bulletin of the American Iron and Steel Association	12	Philadelphia
Bull Am Ry Engng Assn	Bulletin of the American Railway Engineering Association	10	Chicago
Bull Bur of Standards	Bulletin of the Bureau of Standards	Irreg.	Washington
Bull Can Min Inst	Bulletin of the Canadian Mining Institute	4	Montreal
Bull Dept of Labor	Bulletin of the Department of Labor	Irreg.	Washington
Bull Inter Ry Cong	Bulletin of the International Railway Congress	12	Brussels
Bull Sci	Bulletin Scientifique	12	Liège, Belg.
Bull Soc d'Encour	Bulletin de la Société d'Encouragement pour l'Industrie nationale	12	Paris
Bull Soc Int d'Electriciens	Bulletin de la Société Internationale d'Electriciens	12	Paris
Bull Tech d l Suisse Rom	Bulletin Technique de la Suisse Romande	24	Lausanne
Bull Univ of Illinois	Bulletin of the University of Illinois	Irreg.	Urbana, Ill.
Bull Univ of Wisconsin	Bulletin of the University of Wisconsin	Irreg.	Madison, Wis.
Can Dept of Mines	Canadian Department of Mines	Irreg.	Ottawa
Can Engr	Canadian Engineer	12	Toronto
Can Min Jour	Canadian Mining Journal	24	Toronto

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
Castings	Castings	12	Cleveland, O.
Cement	Cement	12	New York
Cement Era	Cement Era	12	Chicago
Chem Engs	Chemical Engineer	12	Chicago
Chem Met & Min Soc of S Africa	Chemical, Metallurgical and Min- ing Society of South Africa	12	Johannesburg
Coal Age	Coal Age	52	New York
Col Guard	Colliery Guardian	52	London
Col Univ Quar	Columbia University Quarterly	4	New York
Compressed Air	Compressed Air	12	New York
Conc-Cem-Age	Concrete-Cement-Age	12	New York
Cont Rec	Contract Record	52	Toronto
Cornell Civ Engr	Cornell Civil Engineer	9	Ithaca, N. Y.
Economic Geol	Economic Geology	8	So. Bethlehem
Elec Engng	Electrical Engineering	12	Dalton, Ga.
Elec Jour	Electric Journal	12	Pittsburgh, Pa.
Elect'n Lond	Electrician	52	London
Elec Rev & W Elec	Electrical Review and Western Electrician	52	Chicago
Elec Rev Lond	Electrical Review	52	London
Elec Ry Jour	Electric Railway Journal	52	New York
Elec Trac	Electric Traction	12	Chicago
Elec Wld	Electrical World	52	New York
Elek Kraft u Bahnen	Elektrische Kraftgetriebe und Bahnen	36	Munich
Elektrochem Zeit	Elektrochemische Zeitschrift	12	Berlin
Elektrotech Rund	Elektrotechnische und Polytech- nische Rundschau	52	Potsdam
Elek u Masch	Elektrotechnik und Maschinenbau	52	Vienna
Eng & Min Jour	Engineering and Mining Journal	52	New York
Eng Mag	Engineering Magazine	12	New York and London
Eng News	Engineering News	52	New York
Engng	Engineering	52	London
Engng Contr	Engineering Contractor	12	New York
Engng & Contr	Engineering and Contracting	52	Chicago
Eng Rec	Engineering Record	52	New York
Engr Lond	Engineer	52	London
Feuerungs	Feuerungstechnik	24	Leipzig
Foundry	Foundry	12	Cleveland
Gas Wld	Gas World	52	London
Gen Elec Rev	General Electrical Review	12	Schenectady
Génie Civil	Génie Civil	52	Paris
Giess Zeit	Giesserei Zeitung	24	Berlin
Glasers Ann	Glaser's Annalen für Gewerbe und Bauwesen		Berlin
Glückauf	Glückauf	52	Essen, Germany
Heat & Ven Mag	Heating and Ventilating Magazine	12	New York
Horseless Age	Horseless Age	52	New York
Ice & Refrig	Ice and Refrigeration	12	New York
Il Cemento	Il Cemento	6	Milan
Ind Wld	Industrial World	52	Pittsburgh
Indus Engng	Industrial Engineering	12	New York
Industria	Industria	52	Milan
Ingenieur	De Ingenieur	52	Hague
Ing Ferro	L'Ingegneria Ferroviaria	24	Rome
Ins Engng	Insurance Engineering	12	New York
Int Marine Engng	International Marine Engineering	12	New York
Ir Age	Iron Age	52	New York
Ir & Coal Trds Rev	Iron and Coal Trades Review	52	London
Ir and Steel Inst	Iron and Steel Institute	Irreg.	London
Ir Trd Rev	Iron Trade Review	52	Cleveland
Jour of Accountancy	Journal of Accountancy	12	New York

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
Jour Am Brass Found Assn	Journal of the American Brass Founders' Association	Irreg.	Buffalo
Jour Am Foundrymen's Assn	Journal of the American Foundrymen's Association	12	New York
Jour Am Soc Mech Engrs	Journal American Societ of Mechanical Engineers	Irreg.	New York
Jour Am Soc of Nav Engrs	Journal of the American Society of Naval Engineers	4	New York
Jour Assn Eng Socs	Journal of the Association of Engineering Societies	12	Boston
Jour Can Min Inst	Journal of the Canadian Mining Institute	1	Montreal
Jour Cleveland Engng Soc	Journal of the Cleveland Engineering Society	12	Cleveland
Jour Effic Soc	Journal of the Efficiency Society	12	New York
Jour Fr Inst	Journal Franklin Institute	12	Philadelphia
Jour Ir & St Inst	Journal of the Iron and Steel Institute	2	London
Jour N E Water Wks Assn	Journal of the New England Waterworks Association	4	Boston
Jour Roy Inst of Brit Arch	Journal of the Royal Institute of British Architects	24	London
Jour Roy United Service Inst	Journal of the Royal United Service Institute	12	London
Jour Soc Arts	Journal of the Society of Arts	52	London
Jour Transvaal Inst of Mech Engrs	Journal of the Transvaal Institute of Mechanical Engineers	Irreg.	Johannesburg
Jour U. S. Artillery	Journal of United States Artillery	6	Fort Monroe
Jour W of Scot Ir & St Inst	Journal West of Scotland Iron and Steel Institute	12	Glasgow
Jour Worcester Plyn Inst	Journal of Worcester Polytechnic Institute	6	Worcester
Jour W Soc Engrs	Journal of the Western Society of Engineers	6	Chicago
Kälte Ind	Die Kälte Industrie	12	Hamburg
Locomotive	Locomotive	12	Hartford
Mach	Machinery	12	New York
Marine Eng & Nav Archt	Marine Engineer and Naval Architect	12	London
Marine Rev	Marine Review	52	Cleveland
Mech Eng	Mechanical Engineer	52	Manchester
Mech Wld	Mechanical World	52	London
Mem Soc Ing Civ de France	Memoires de la Société des Ingenieurs Civils de France	12	Paris
Met & Chem Engng	Metallurgical and Chemical Engineering	12	New York
Mines & Min	Mines and Minerals	12	Scranton
Min Jour	Mining Journal	52	London
Min Mag	Mining Magazine	12	London
Min & Sci Pr	Mining and Scientific Press	52	San Francisco
Min & Engng Wld	Mining and Engineering World	52	Chicago
Mitt d Ver f d Förd d Local u Strassengahnwesens	Mittheilungen des Vereines für die Förderung des Local und Strassenbahnwesens	12	Vienna
Mnfrs Rec	Manufacturers' Record	52	Baltimore
Monit Tec	Il Monitore Tecnico	36	Milan
Motorwagen	Der Motorwagen	24	Berlin
Munic Engng	Municipal Engineering	12	Indianapolis
Munic Jour	Municipal Journal	52	New York
Nat Geog Mag	National Geographic Magazine	12	Washington
Nature	Nature	52	London
Nature	La Nature	52	Paris
Nineteenth Cent	Nineteenth Century	12	London

REFERENCE LIST OF PERIODICALS

5

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
N Z Mines Rec	New Zealand Mines Record	12	Wellington
Oest Zeit f Berg- und Hüt- tenwesen	Oesterreichische Zeitschrift für Berg- und Hüttenwesen	52	Vienna
Phil Jour of Sci	Philippine Journal of Science	4	Manila
Pop Mech	Popular Mechanics	12	Chicago
Pop Sci M	Popular Science Monthly	12	New York
Power	Power	52	New York
Prac Eng Lond	Practical Engineer	52	London
Prac Engr	Practical Engineer	24	Chicago
Pro Am Inst Elec Engrs	Proceedings American Institute of Electrical Engineers	12	New York
Pro Am Min Cong	Proceedings American Mining Con- gress	Irreg.	Philadelphia
Pro Am Soc Civ Engrs	Proceedings of the American So- ciety of Civil Engineers	12	New York
Pro Am Soc Heat & Ven Engrs	Proceedings American Society of Heating and Ventilating Engi- neers	Irreg.	New York
Pro Am Water Works Assn	Proceedings of the American Water Works Association	1	Charleston
Pro Brooklyn Engrs Club	Proceedings of the Brooklyn En- gineers' Club	1	New York
Pro Can Soc Civ Engrs	Proceedings of the Canadian So- ciety of Civil Engineers	Irreg.	Montreal
Pro Central Ry Club	Proceedings of the Central Rail- way Club	26	Philadelphia
Pro Engrs Club of Phila	Proceedings of the Engineers' Club of Philadelphia	4	Philadelphia
Pro Engrs Soc of West Penn	Proceedings of the Engineers' So- ciety of Western Pennsylvania	12	Pittsburgh
Pro Inst Civ Engrs	Proceedings of the Institution of Civil Engineers	Irreg.	London
Pro Inst Elec Engrs	Proceedings of the Institution of Electrical Engineers	Irreg.	London
Pro Inst Mech Engrs	Proceedings of the Institution of Mechanical Engineers	Irreg.	London
Pro Inst Min & Met	Proceedings of the Institution of Mining and Metallurgy	12	London
Pro N Y Ry Club	Proceedings of the New York Rail- way Club	12	New York
Pro Ry Club of Pittsburgh	Proceedings of the Railway Club of Pittsburgh	12	Pittsburgh
Pro Soc Engrs	Proceedings of the Society of En- gineers	Irreg.	London
Pro S & S-W Ry Club	Proceedings of the Southern and Southwestern Railway Club	1	Atlanta
Pro St Louis Ry Club	Proceedings St. Louis Railway Club	12	St. Louis
Pro U S Naval Inst	Proceedings of the United States Naval Institute	4	Annapolis
Pro West Ry Club	Proceedings of the Western Rail- way Club	12	Chicago
Qr Rev	Quarterly Review	4	London
Quarry	Quarry	12	London
Queensland Gov Min Jour	Queensland Government Mining Journal	12	Brisbane
Rev de Mécan	Revue de Mécanique	12	Paris
Rev de Métal	Revue de Métallurgie	12	Paris
Rev d'Econ Indus	Revue d'Economie Industrielle	12	Paris
Rev d'Electricite	Revue d'Electricite	12	Brussels
Rev d'Electrochim et d'Elec- trométal	Revue d'Electrochimie et d'Elec- trometallurgie	12	Paris
Rev Indus	Revue Industrielle	52	Paris

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
Rev Gen des Chemins de Fer	Revue Générale des Chemins de Fer	12	Paris
Rev gen des Sciences	Revue générale des Sciences pures et appliquées	24	Paris
Rivista Marittima	Rivista Marittima	12	Rome
Ry Age Gaz	Railway Age Gazette	52	New York
Rudder	Rudder	12	New York
Ry & Engng Rev	Railway and Engineering Review	52	Chicago
Ry Gaz	Railway Gazette	52	London
Ry & Loc Engng	Railway and Locomotive Engineering	12	New York
Ry Mas Mech	Railway Master Mechanic	12	Chicago
Ry Engng & Maintenance of Way	Railway Engineering and Maintenance of Way	12	Chicago
S A E Bull	S. A. E. Bulletin	12	New York
Schiffbau	Schiffbau	24	Berlin
Sch Mines Quar	School of Mines Quarterly	4	New York
Schweiz Bau	Schweizerische Bauzeitung	52	Zürich
Sci Am	Scientific American	52	New York
Sci Am Sup	Scientific American Supplement	52	New York
Shipbldr	Shipbuilder	12	Newcastle-on-Tyne
Sib Jour Engng	Sibley Journal of Engineering	12	Ithaca
Soc Belge d Elec	Société Belges des Electriciens	12	Brussels
Stahl u Eisen	Stahl und Eisen	52	Düsseldorf
Stevens Ind	Stevens Institute Indicator	4	Hoboken, N. J.
Surveyor	Surveyor	52	London
Tech Mod	Le Technique Moderne	12	Paris
Tele Engr	Telephone Engineer	12	Chicago
Telephony	Telephony	12	Chicago
Tram & Ry Wld	Tramway and Railway World	12	London
Trans Am Soc Nav Arch & Mar Engrs	Transactions of the American Society of Naval Architects and Marine Engineers	Irreg.	New York
Trans Inst Civ Engrs of Ireland	Transactions Institute of Civil Engineers of Ireland	Irreg.	Dublin
Trans Inst Eng & Ship in Scot	Transactions Institute Engineers and Shipbuilders in Scotland	Irreg.	Glasgow
Trans N-E Coast Inst of Engrs & Shbldrs	Transactions N.-E. Coast Institute of Engineers and Shipbuilders	12	Newcastle
Turbine	Die Turbine	24	Berlin
U. S. Dept of Agriculture	U. S. Department of Agriculture	Irreg.	Washington
U S Dept of Mines	U. S. Department of Mines	Irreg.	Washington
U S Geol Survey	U. S. Geological Survey	Irreg.	Washington
Werkzeug	Werkzeugmaschine	24	Berlin
West Engng	Western Engineering	12	San Francisco
Wisconsin Engr	Wisconsin Engineer	12	Madison, Wis.
Wlds Work	World's Work	12	New York
Wood Craft	Wood Craft	12	Cleveland
Yacht	Le Yacht	52	Paris
Yale Sci Month	Yale Scientific Monthly	9	New Haven
Zeit d Oest Ing u Arch Ver	Zeitschrift des Oesterreichischen Ingenieur- und Architekten Vereines	52	Vienna
Zeit d Ver deutscher Ing	Zeitschrift des Vereines deutscher Ingenieure	52	Berlin
Zeit f d ges Turbinenwesen	Zeitschrift für das gesamte Turbinenwesen	36	Munich

CLASSIFICATION OF THE INDEX

TO THE USER: This classification should always be consulted, and the page number of the proper division ascertained, before looking for an item in the body of the book.

CIVIL ENGINEERING

BRIDGES

Abutments	25	Dumbarton	29	Masonry	31	Replacement	34
Arches	25	East Haddam, Conn.....	29	Material	31	Roadways	35
Bascule	26	Erection	29	New York.....	31	Sawing	35
Boston	27	Erection Costs.....	29	Ohio River.....	31	Scherzer	35
Cairo	27	English Channel.....	29	Piers	31	Steel	35
Canada	27	Failure	29	Plate-Girders	31	St. Lawrence.....	35
Cantilevers	27	Floors	29	Pontoons	31	St. Louis.....	35
Chain	27	Forth Bridge.....	30	Portland, Ore....	32	Submerged Viaducts.....	35
China	27	Foundations	30	Quebec	32	Substructures	35
Cologne	27	Highway	30	Railway	32	Suspension	35
Concrete	27	Hudson River.....	30	Reconstruction ..	32	Swing Span.....	36
Constantine	28	Italy	30	Reinforced Concrete.....	33	Vancouver	36
Construction	28	Kaw River.....	30	Reinforcing	34	Viaducts	36
Culverts	28	Loads	30	Removal	34	Widening	37
Curves	28	Maintenance	30	Renewals	34	Wooden Bridges..	37
Design	29						
Drawbridges	29						

CONSTRUCTION

Acoustics	37	Construction Plant....	41	Factories	43	Methods	46
Air Pressures....	37	Construction Progress.	41	Factory Buildings.....	43	Mill Buildings..	46
Arch Design.....	37	Contractors' Plants....	41	Failures	43	Partitions	46
Buildings	37	Contracts	41	Fire Extinguishing	43	Piles	46
Building Laws....	39	Contract Work.....	41	Fire Houses.....	43	Piling	47
Bunkers	39	Cost Keeping.....	41	Fire Prevention.....	43	Post-Office	47
Caissons	39	Cotton Mills.....	41	Fireproof Building.....	43	Rams	47
Camp Sanitation.	39	Court House.....	41	Fire Protection..	44	Razing	47
Cement Gun.....	39	Crushers	42	Floors	44	Reclamation	47
Chimneys	39	Domes	42	Foundation Plates.....	45	Reinforced Concrete.....	48
Chutes	39	Drainage	42	Foundations.....	45	Retaining Walls..	49
Cofferdams	39	Drilling	42	Framework	46	Rock Slides.....	49
Columns	39	Earth Pressure.....	42	Gas Holders.....	46	Roofs	49
Compressed Air..	39	Earthquakes	42	Grading	46	Sanitation	50
Concrete	39	Electric Power.....	42	Grain Elevators..	46	Schools	50
Concrete Buildings.....	40	Engineering Fees ..	42	Granaries	46	Shed Design.....	50
Concrete Forms..	40	Estimates	42	Grandstand	46	Skyscrapers.....	50
Concrete Mixers..	41	Excavation	42	Hospitals	46	Specifications ..	50
Concrete Plant....	41	Excavators	43	Labor	46	Stacks	50
Concrete Roofs....	41	Exhibitions	43			Stairway Collapse.....	50
Construction Camps....	41					Steam Shovels...	50

CONSTRUCTION—(Continued)

Steel Frame..... 50	Swimming Bath. 51	Tower Cranes... 51	Vaults 52
Steel Towers..... 50	Test Building... 51	Tunneling Ma- chines..... 51	Waterproofing... 52
Steelwork 50	Theatres 51	Tunnel Lining... 51	Wind Bracing... 53
Steelwork Design 50	Timber Preserva- tion..... 51	Tunnels 51	Woolworth Build- ing..... 53
Stone Crushers.. 51	Tornado Effects. 51	Underpinning .. 52	
Stucco 51			

MATERIALS OF CONSTRUCTION

Asphalt 53	Concrete Plant.. 57	Piling 58	Structural Metal. 60
Asphalt Plants.. 53	Creosote 57	Reinforced Con- crete..... 58	Tan Bark..... 61
Brick 53	Drain Tile..... 57	Reinforced Con- crete Beams.. 59	Tar 61
Building Stones. 53	Fireproof 57	Reinforced - Con- crete Columns. 60	Terra-Cotta .. 61
Cement 53	Forest Products. 57	Reinforced - Con- crete Slabs... 60	Timber 61
Cement Handling 55	Gravel 57	Reinforcing 60	Timber Preserva- tion..... 62
Cement Mill..... 55	Lath 57	Sand Washing.. 60	Waste Wood.... 63
Cement Pipes... 55	Lime 57	Specifications .. 60	Waterproofing... 63
Cement Plants.. 55	Lumber 58	Steel 60	White Lead..... 63
Clays 55	Metallic Coatings 58		Windows 63
Concrete 55	Paint Estimates. 58		Wood 63
Concrete Blocks. 57	Paints 58		
Concrete Piles.. 57	Piers 58		

MEASUREMENT

Arithmetic 63	Flow 64	Planetables 65	Surveying Instru- ments..... 67
Beams 63	Formulas 64	Rock Tests..... 65	Testing Labora- tories..... 67
Beam Tests..... 63	Hydrography ... 64	Run-Off 65	Tests 67
Bending Moments 63	Hysteresis 64	Slabs 65	Theodolites 67
Bridge Stresses. 64	I-Beams 64	Side Rules..... 65	Timber Testing.. 67
Cement Testing. 64	Laboratories ... 64	Soil Tests..... 65	Topographical Bureau..... 67
Columns 64	Leveling 64	Solar Observa- tions..... 65	Truss Calcula- tions..... 67
Concrete Testing. 64	Magnetic Declin- ations..... 65	Stadia Float.... 65	Venturi Meters.. 67
Drain Tile Tests. 64	Maps 65	Stone Testing... 65	Wind Pressure.. 68
Drawings 64	Meters 65	Stresses 65	
Earth Pressures. 64	Photography ... 65	Surveying 66	
Earthwork 64	Pitot Tube..... 65		
Floor Tests..... 64			

MUNICIPAL

Atmospheric Pol- lution..... 68	Fire Losses..... 69	New Jersey Rules..... 70	Sewage Pumping 75
Bath Houses..... 68	Fire Prevention. 69	Purchasing 70	Sewage Purifica- tion..... 75
Baths 68	Food Preserva- tion..... 69	Refuse 70	Sewage Treat- ment..... 75
Budgets 68	Garbage 69	Refuse Collection 71	Sewerage 75
City Planning... 68	Garbage disposal 69	Refuse Destruct- ors..... 71	Sewer Pipe..... 76
City Supplies... 68	Housing 70	Refuse Disposal. 71	Sewers 76
City Surveys... 68	Incinerator 70	Refuse Removal. 71	Sewer Screens.. 77
City Traffic..... 68	Leeds 70	Sanitary Ware.. 71	Sewer Systems.. 77
Cost Keeping... 68	London 70	Sanitation 71	Smoke 77
Delhi, India... 69	Mine Effects... 70	Seattle 72	Storm Sewers... 78
Drainage 69	Municipal Law.. 70	Sewage 72	Storm Water... 78
Efficiency 69	Municipal Plants. 70	Sewage Disposal. 72	Town Planning.. 78
Financing 69	Municipal Works 70	Sewage Filters.. 75	Waste 79
Fire Alarms.... 69	Newcastle, Eng.. 70	Sewage Flow.... 75	
Fire Apparatus. 69			

ROADS AND PAVEMENTS

Accounting 79	Asphalt Plant.. 80	Brick 81	Contract Law... 83
Administration.. 79	Australasia 80	By-Pass 81	Contracts 83
Asphalt 79	Baltimore 80	California 81	Convict Labor.. 83
Asphalt Block... 80	Belgian Block.. 80	Concrete 81	Culverts 83
Asphaltic Con- crete..... 80	Bends 80	Concrete Costs.. 83	Cuts 83
	Bituminous 80	Construction .. 83	Driveways 83

ROADS AND PAVEMENTS—(Continued)

Dust Prevention.....	84	Location.....	86	Paving Tests.....	88	Sprinklers.....	89
Earth Roads.....	84	Louisiana.....	86	Pennsylvania.....	88	Stone.....	89
Education.....	84	Macadam.....	86	Philippines.....	88	Street Cleaning.....	89
Engineering.....	84	Macadam Mate- rial.....	87	Plank Road.....	88	Street Design.....	90
Equipment.....	84	Machinery.....	87	Planning.....	88	Street Sprinkling.....	90
Europe.....	84	Maintenance.....	87	Public Roads.....	88	Substructure.....	90
European Paving.....	84	Manitoba.....	87	Purchasing.....	88	Suburban.....	90
European Roads.....	84	Maryland.....	87	Quebec.....	88	Surfaces.....	90
Excavation.....	84	Materials.....	87	Reconstruction.....	88	Surface Treat- ment.....	90
Experimental Pavements.....	84	Material Trans- port.....	87	Reinforced Con- crete.....	88	Surfacing.....	90
Experimental Roads.....	84	Michigan.....	87	Repairs.....	88	Tar Macadam.....	90
Flood Effects.....	84	Motor Traffic.....	87	Repaving.....	89	Traction.....	91
France.....	85	New Jersey.....	87	Resurfacing.....	89	Traffic.....	91
Germany.....	85	New York.....	87	Road Congress.....	89	Traffic Census.....	91
Good Roads.....	85	Oil Storage.....	87	Road Machinery.....	89	Traffic Study.....	91
Grades.....	85	Ontario.....	88	Road Metal.....	89	Types.....	91
Granite Block.....	85	Organization.....	88	Road Models.....	89	Valuation.....	91
Highways.....	85	Pavements.....	88	Road Stones.....	89	Wear.....	91
Inspection.....	85	Paving Blocks.....	88	Road Traffic.....	89	Wisconsin.....	91
Labor.....	86	Paving Machine.....	88	Sand Clay.....	89	Wood.....	91
Law.....	86	Paving Mainte- nance.....	88	Saskatchewan.....	89	Wood Block.....	91
Lighting.....	86			Specifications.....	89		

WATER SUPPLY

Analyses.....	92	Ground-Waters.....	99	Public Baths.....	105	Stream Gauging.....	111
Aqueducts.....	92	Hygiene.....	100	Pumping Plants.....	105	Stream Regula- tion.....	111
Artesian.....	92	Intake Crib.....	100	Pumping Sta- tions.....	105	Supply Prob- lems.....	111
Ashken Reser- voir.....	92	Intakes.....	100	Purification.....	106	Supply Systems.....	111
Birmingham, England.....	93	Irrigation.....	100	Rates.....	107	Tanks.....	111
Canal Linings.....	93	Jersey Island.....	102	Reforestation.....	107	Typhoid.....	112
Catskill Aque- duct.....	93	Leicester, Eng.....	102	Reservoir Clean- ing.....	107	Typhoid Tests.....	112
Chicago.....	93	Leptomit.....	102	Reservoir Fail- ure.....	107	Valuation.....	112
China.....	93	Log Flumes.....	102	Reservoirs.....	108	Vancouver.....	112
Chlorination.....	93	Los Angeles.....	102	Residence Sup- ply.....	109	Waste.....	112
Clarification.....	93	Mains.....	102	Review of 1912.....	109	Water Analyses.....	112
Coagulation.....	93	Meters.....	103	Rotterdam.....	109	Water Consump- tion.....	112
Colorado.....	93	New Jersey Rules.....	103	Run-Off.....	109	Water Depart- ments.....	113
Conduits.....	93	Ottawa.....	103	San Francisco.....	109	Water Laws.....	113
Conservation.....	93	Panama.....	103	Sanitation.....	109	Water Power.....	113
Corrosion.....	93	Paris.....	103	Saskatchewan.....	109	Water Ram.....	113
Dam Design.....	93	Philippines.....	103	Seepage.....	109	Water Rates.....	113
Dams.....	94	Pipe.....	103	Settling Basin.....	109	Water Resources.....	113
Drinking Water.....	96	Pipe Cleaning.....	103	Silt Deposits.....	109	Watersheds.....	113
Edmonton, Alta.....	96	Pipe Corrosion.....	103	Siphons.....	109	Water Towers.....	113
Evaporation.....	96	Pipe Flow.....	103	Snow Conserva- tion.....	109	Water Works Accounting.....	114
Filtration.....	97	Pipe Freezing.....	104	Snow Surveys.....	110	Weirs.....	114
Fire Protection.....	98	Pipe Laying.....	104	Softening.....	110	Wells.....	115
Fire Service.....	98	Pipe Lines.....	104	Specifications.....	110	Winnipeg.....	115
Fire Streams.....	98	Pipe Obstruc- tions.....	104	Stand Pipes.....	110	Wood Pipe.....	115
Fire Systems.....	98	Pipe Protection.....	104	Sterilization.....	110	Woolworth Build- ing.....	115
Flow.....	99	Pipes.....	104	Stream Flow.....	111		
Flumes.....	99	Pitot Tube.....	104				
Forests.....	99	Plumbing.....	104				
Franchises.....	99	Pollution.....	104				
Great Lakes.....	99	Preliminaries.....	105				

WATERWAYS AND HARBORS

Barge Canal.....	115	Channels.....	116	Dock Machinery.....	117	Flood Preven- tion.....	118
Breakwaters.....	115	China.....	117	Docks.....	117	Flood Protection.....	119
Brest.....	115	Colorado River.....	117	Drainage.....	117	Flood Reser- voirs.....	119
Canal Lining.....	115	Curacao.....	117	Dredging.....	118		
Canals.....	115	Dikes.....	117	Flood Control.....	118		

WATERWAYS AND HARBORS—(Continued)

Floods.....	119	Locks.....	122	River Improve-	ment.....	126	Stream Gaging.....	127		
Flood Sanita-	tion.....	120	Madras.....	122	River Naviga-	tion.....	126	Submarine Exca-	vation.....	127
Gage Heights.....	121	Manchester, Eng.	122	Mississippi			Terminals.....	127	Tidal Lands.....	128
Great Lakes.....	121	River.....	122	River Regula-	tion.....	126	Tidal Phenome-	na.....	128	
Harbor Machin-	ery.....	121	Missouri River.....	122	Rotterdam.....	126	Toronto.....	128	Towage.....	128
Harbors.....	121	Ore Docks.....	122	Sand Bars.....	126	San Francisco.....	126	United States		
Inland Naviga-	tion.....	121	Panama Canal.....	122	San Pedro, Calif.	126	Waterways.....	128	Waterfronts.....	128
Japan.....	121	Paris.....	124	Seattle.....	126	Sedimentation.....	126	Wave Action.....	128	
Jetties.....	121	Piers.....	124	Sea Walls.....	126	Seine.....	126	Wharf-Bulkhead.....	128	
Lake Erie.....	121	Portland, Ore.....	125	Sedimentation.....	126	Shore Protection.....	127	Wharves.....	128	
Levees.....	121	Ports.....	125	Reviews of 1912.....	125	South Africa.....	127			
Lighthouses.....	122	Rhone.....	125	River Banks.....	125	South America.....	127			
Livingstone		River Control.....	125							
Channel.....	122									

MISCELLANY

Agriculture . . .	128	Caisson Disease .	128	Geology	129	Mosquito Exter-	
Alaskan Bound-		Design	128	India	129	mination	129
ary	128	Forest Fires . . .	129	Meteorology . . .	129	National Control .	129
America	128	Forestry	129	Montana	129	Philippines	129
British Parliam-		Forests	129	Mosquitoes	129	Research	129
ent	128	Forest Service . .	129			Sand Dunes	129

ELECTRICAL ENGINEERING

COMMUNICATION

Antennæ.....	130	Great Britain.....	130	Submarine		Time signals.....	134
Automatic Ex-		Interference.....	130	Cables.....	132	Towers.....	134
changes.....	130	Longitude.....	130	Submarine		Wireless Sta-	
Combined Serv-		Paris.....	130	Telegraphy.....	132	tions.....	134
ice.....	130	Radiography.....	131	Telegraph Lines.....	133	Wireless Tele-	
Conductors.....	130	Radiotelegraphy.....	131	Telegraphy.....	133	phony.....	134
Development.....	130	Radiometry.....	131	Telephone Cables.....	133	Wireless Towers.....	134
Earth Antennæ.....	130	Signalling.....	132	Telephony.....	133	Wireless Trans-	
Exchanges.....	130	Signals.....	132	Telephotography.....	134	formers.....	135

DISTRIBUTION

Alternating Current.....	135	Currents.....	135	Parallel Operation.....	136	Switch Design.....	136
Circuit Breakers.....	135	Field Distribution.....	135	Power Distribution.....	136	Switches.....	136
Circuits.....	135	Fuse.....	135	Regulators.....	136	Switching.....	136
City Lines.....	135	Grounding.....	135	Relays.....	136	Three-Wire.....	137
Conduits.....	135	Mine Wiring.....	136	Switchboards.....	136	Three Wire System.....	137
Converters.....	135	Oil Switches.....	136			Wiring.....	137

DYNAMOS AND MOTORS

A. C. Motors.....	137	Converters.....	141	Homopolar.....	142	Motor Slip.....	143
Air-Gaps.....	138	Cooling.....	141	Hunting.....	142	Purchasing.....	143
Alternators.....	138	D. C. Machines.....	141	Induction Coils.....	142	Railway Motors.....	143
Armature Discs.....	139	Design.....	141	Induction Motors.....	142	Rating.....	144
Armatures.....	139	Dynamos.....	141	Inspection.....	142	Reactance.....	144
Brushes.....	139	Experi men-		Losses.....	143	Regulators.....	144
Brush Losses.....	139	tal Plant.....	141	Machine Founda-		Reversing	
Coils.....	139	Fan Motors.....	141	tions.....	143	Motors.....	144
Commutation.....	139	Flashing.....	141	Mill Motors.....	143	Series-Wound.....	144
Commotators.....	140	Generators.....	141	Motor Casings.....	143	Shafts.....	144
Condensers.....	140	Heat Tests.....	141	Motor Perform-		Single-Phase.....	144
Contractor.....	140	Heat Transmis-		ance.....	143	Small Motors.....	144
Control.....	140	sion.....	141	Motor Rating.....	143	Sparkling.....	144

DYNAMOS AND MOTORS—(Continued)

Speed Control. <u>144</u>	Synchronous	Turbo - Alterna-	Turbo - Genera-
Starting <u>144</u>	Converters <u>145</u>	tors <u>145</u>	tors <u>146</u>
Switches <u>145</u>	Three-Phase <u>145</u>	Turbo - Conver-	Voltage Regula-
Synchronizing <u>145</u>	Three Wire <u>145</u>	ter <u>145</u>	tion <u>146</u>
	Troubles <u>145</u>		Windings <u>146</u>

ELECTRO-CHEMISTRY

Albumen <u>146</u>	Electric Fur-	Electrolysis <u>149</u>	Hydrogen <u>150</u>
Cells <u>146</u>	naces <u>148</u>	Electroyme-	Industrial Chem-
Corrosion <u>146</u>	Electrochemical	tallurgy <u>149</u>	istry <u>150</u>
Cyanamid <u>147</u>	Society <u>149</u>	Electroplating <u>149</u>	Nitrogen <u>150</u>
Developments <u>147</u>	Electrodes <u>149</u>	Etching <u>150</u>	Oxygen <u>150</u>
			Ozone <u>151</u>

ELECTRO-PHYSICS

Atoms <u>151</u>	Hyperbolic Func-	Physiological Ef-	Resonance <u>155</u>
Condensers <u>151</u>	tions <u>152</u>	fects <u>154</u>	Solutions <u>155</u>
Conductivity <u>151</u>	Hysteresis <u>152</u>	Precipitation <u>154</u>	Spark Gaps <u>155</u>
Conductors <u>151</u>	Inductance <u>152</u>	Pseudo - Reso-	Spark Voltage <u>155</u>
Dielectrics <u>151</u>	Insulation <u>152</u>	nance <u>154</u>	Tempera-
Electrical Phe-	Magnetic Prop-	Raditions <u>154</u>	ture Rise <u>155</u>
nomena <u>152</u>	erties <u>153</u>	Radioactivity <u>154</u>	Thermocouples <u>155</u>
Electrons <u>152</u>	Magnetism <u>153</u>	Radiography <u>154</u>	Thermopiles <u>155</u>
Electroscope <u>152</u>	Magnets <u>153</u>	Reactance <u>154</u>	Transients <u>156</u>
Endosmose <u>152</u>	Micarta <u>153</u>	Rectifiers <u>154</u>	Voltage <u>156</u>
Energy <u>152</u>	Oscillations <u>153</u>	Resistance <u>154</u>	Waves <u>156</u>
Explosions <u>152</u>	Oscillograms <u>153</u>	Resistance Coils <u>155</u>	Wave Shapes <u>156</u>
Frequency <u>152</u>			

GENERATING STATIONS

Accidents <u>156</u>	Cooling Water <u>159</u>	Load Curves <u>164</u>	Prime Movers <u>165</u>
Accumulators <u>156</u>	Costs <u>159</u>	Load Equalizers <u>164</u>	Rates <u>166</u>
Alabama <u>157</u>	Dover, Eng. <u>159</u>	Load Factors <u>164</u>	Reactance <u>166</u>
Auxiliary Sta-	Draft Tubes <u>159</u>	Loads <u>165</u>	Reliability <u>166</u>
tions <u>157</u>	Engines <u>159</u>	London <u>165</u>	Stations <u>166</u>
Batteries <u>157</u>	Equipment <u>159</u>	Manchester, Eng. <u>165</u>	Substations <u>166</u>
Central Stations <u>157</u>	Extensions <u>159</u>	Municipal Sta-	Switchboards <u>166</u>
Chicago <u>158</u>	Floods <u>159</u>	tion <u>165</u>	Turbine Plant <u>166</u>
Combi-	Hydro-Electric <u>159</u>	Operation <u>165</u>	Turbine Station <u>167</u>
nation Plant <u>158</u>	Illinois <u>164</u>	Power-Factor <u>165</u>	Turin <u>167</u>
Combi-	Incandescent	Power Houses <u>165</u>	Water-Wheels <u>167</u>
nation Station <u>158</u>	Lamps <u>164</u>	Power Plants <u>165</u>	
Cooling Plant <u>159</u>	Isolated Plants <u>164</u>	Power Systems <u>165</u>	

LIGHTING

Arc Lamps <u>167</u>	Helium <u>168</u>	Mercury Vapor <u>170</u>	Theatres <u>172</u>
Arcs <u>167</u>	House Lighting <u>168</u>	Municipal Plant <u>170</u>	Three-Phase <u>172</u>
Automatic Plant <u>167</u>	Illuminants <u>168</u>	Nitrogen Lamp <u>170</u>	Tungsten <u>172</u>
Bridges <u>167</u>	Illumination <u>168</u>	Panama Canal <u>170</u>	Tungsten Lamps <u>173</u>
Buildings <u>167</u>	Incandescent	Pentane Lamps <u>170</u>	Vacuum Tubes <u>173</u>
Cost <u>167</u>	Lamps <u>169</u>	Public Buildings <u>170</u>	Vapor Lamps <u>173</u>
Distribution <u>168</u>	Indirect <u>169</u>	Quartz Lamps <u>171</u>	Visual Acuity <u>173</u>
Electric Light-	Laboratory <u>169</u>	Reflection <u>171</u>	Visual Effects <u>173</u>
ing <u>168</u>	Lamps <u>169</u>	Reflectors <u>171</u>	Voltage Va-
Europe <u>168</u>	Lighting Com-	Shop Lighting <u>171</u>	riation <u>173</u>
Factories <u>168</u>	parisons <u>170</u>	Store Lighting <u>171</u>	Winch <u>174</u>
Filaments <u>168</u>	Magnetite <u>170</u>	Street Lighting <u>171</u>	Wiring <u>174</u>
Head-Lamps <u>168</u>	Mercury-Arc <u>170</u>	Streets <u>172</u>	

MEASUREMENT

Alternating Cur-	Appliances <u>174</u>	Efficiency <u>174</u>	Electrometers <u>174</u>
rent <u>174</u>	Cartography <u>174</u>	Electrical Instru-	Flow Meters <u>174</u>
Amperes <u>174</u>	Charts <u>174</u>	ments <u>174</u>	Heat Measure-
Apparatus Test-	Conductivities <u>174</u>	Electro-Dynamo-	ments <u>174</u>
ing <u>174</u>	Dynamometer <u>174</u>	meters <u>174</u>	High Voltage <u>175</u>

MEASUREMENT—(Continued)

Hyperbolic Functions.....	175	Load Tests.....	175	Power Losses.....	177	Temperature.....	178
Illumination.....	175	Machine Tests.....	175	Power Measure-		Testing Appa-	
Indicators.....	175	Magnetic Fields.....	176	ment.....	177	ratus.....	178
Inductance.....	175	Magnetic Obser-		Pyrometry.....	177	Testing Plants.....	178
Instrument Test-		vatory.....	176	Radiometer.....	177	Tests.....	178
ing.....	175	Magnetism.....	176	Rating.....	177	Torque.....	178
Insulator Test-		Meter Installa-		Resistance.....	177	Transformer	
ing.....	175	tions.....	176	Rheostat.....	177	Tests.....	179
Irregularity.....	175	Meters.....	176	Shop Testing.....	177	Units.....	179
Kinematography.....	175	Nomograms.....	176	Standardization.....	177	Voltage.....	179
Laboratory.....	175	Permeability.....	176	Stray Currents.....	177	Voltmeter.....	179
Light Standard.....	175	Photometry.....	176	Synchronism In-		Voltmeters.....	179
		Potentiometers.....	177	dicators.....	177	Wattmeters.....	179

POWER APPLICATIONS

Agriculture.....	179	Department		Jewelry.....	182	Printing.....	183
Book-Binding.....	180	Stores.....	180	Logging.....	182	Quarries.....	183
Breweries.....	180	Domestic.....	180	Lumber Industry.....	182	Salt Mining.....	183
Building Equip-		Electrical Prog-		Lumber Mills.....	182	Shovels.....	183
ment.....	180	ress.....	180	Marine.....	182	Steel Plants.....	183
Buildings.....	180	Electric Vehicles.....	181	Medical.....	182	Stores.....	183
Canning Fac-		Elevators.....	181	Mills.....	182	Subways.....	183
ories.....	180	Factories.....	181	Mining.....	182	Sugar Making.....	183
Cement Mills.....	180	Fans.....	181	New Business.....	182	Tanneries.....	183
Collieries.....	180	Foundries.....	181	Packing Houses.....	182	Textile.....	183
Construc-		Greenhouses.....	181	Panama Canal.....	183	Towage.....	183
tion Work.....	180	Heaters.....	181	Post Office.....	183	Welding.....	183
Cotton Industry.....	180	Hotels.....	181	Potteries.....	183	Wood Working.....	183
D. C. Plant.....	180	Hotel Service.....	181	Power Require-		Woodworth Build-	
		Industrial.....	181	ments.....	183	ing.....	183

TRANSMISSION

Accidents.....	184	Grounding.....	186	Line Sag.....	189	Series System.....	191
Alternating Cur-		Grounds.....	186	Line Spans.....	189	Stray Currents.....	191
rent.....	184	High Tension.....	186	Line Stresses.....	190	Submarine Ca-	
Aluminum.....	184	High - Tension		Load Disturb-		bles.....	191
Arcing Gound		Lines.....	186	ances.....	190	Submarine	
Suppressor.....	184	High Voltage.....	186	Loads.....	190	Power.....	191
Arresters.....	184	Insulation.....	186	Long Distance.....	190	Substations.....	191
Artificial Lines.....	184	Insulators.....	187	Networks.....	190	Terminals.....	191
Atmospheric Phen-		Leakage.....	187	Outdoor Stations.....	190	Three Phase.....	191
omena.....	184	Lightning.....	188	Poles.....	190	Thury System.....	191
Balancers.....	184	Lightning Arrest-		Power Distribu-		Tower Design.....	192
Cables.....	184	ers.....	188	tion.....	190	Towers.....	192
Condensers.....	185	Lightning Pro-		Protective De-		Transfor-	
Conductors.....	185	tection.....	188	vices.....	190	mer Losses.....	192
Conduits.....	185	Line Capacity.....	188	Rates.....	190	Transformers.....	192
Converters.....	185	Line Design.....	188	Relays.....	191	Voltage Regula-	
Corona.....	185	Line Losses.....	188	Safety Appli-		tion.....	194
Detectors.....	186	Line Records.....	188	ances.....	191	Wiring.....	194
Earthing.....	186	Lines.....	189	Safety Devices.....	191		

MISCELLANY

Accidents.....	194	Copper.....	195	Gramophone.....	195	New England.....	196
Address.....	194	Dangers.....	195	Handbook.....	195	Nomenclature.....	196
Advertising.....	194	Discussions.....	195	Hiring Schemes.....	195	Problems.....	196
Australasia.....	194	Economics.....	195	Liquid Air.....	195	Reviews of 1912.....	196
Austria.....	194	Electrical Instru-		London.....	195	Rules.....	196
B y - Product		ments.....	195	Monopolies.....	195	Statistics.....	196
Plants.....	194	Electrotechnical.....	195	Municipal Con-		Steinmetz.....	196
Congress.....	194	Exhibition.....	195	trol.....	195	Terminology.....	196
Co-operation.....	194	France.....	195				

INDUSTRIAL ECONOMY

- Accident Prevention.....197
 Accounting.....197
 Addresses.....197
 Agriculture.....198
 Appraisals.....198
 Apprenticeship.....198
 Arbitration.....198
 Budget.....198
 Business Administration.....199
 Chemical Industries.....199
 Chemistry.....199
 Combinations.....199
 Commerce.....199
 Commercial Engineering.....199
 Conservation.....199
 Convict Labor.....199
 Co-operation.....199
 Co-partnership.....199
 Corporations.....199
 Cost Keeping.....200
 Cost Methods.....200
 Costs.....200
 Cost Systems.....200
 Depreciation.....200
 Economics.....201
 Education.....201
 Efficiency.....203
 Egypt.....204
 Engineering.....204
 Engineering Societies.....205
 Engineers' Salaries.....205
 Estimating.....205
 Exhibition.....205
 Factory Inspection.....205
 Filing Methods.....206
 Filing Systems.....206
 Finance.....206
 Forestry.....206
 Fritz.....206
 Galveston.....206
 Germany.....206
 Indexing.....206
 Industrial Accidents.....206
 Industrial Chemistry.....206
 Industrial Dis-eases.....206
 Industrial Growth.....207
 Industrial Safety.....207
 Inspection.....207
 Institute.....207
 Invention.....207
 Labor.....207
 Labor Insurance.....208
 Law.....209
 Management.....209
 Motion Study.....211
 Organization.....211
 Patent Laws.....212
 Patents.....212
 Penology.....212
 Pension Systems.....212
 Philippines.....212
 Piecework.....212
 Planning Systems.....212
 Premium System.....212
 Prices.....212
 Profit Sharing.....213
 Publicity.....213
 Public Lands.....213
 Public Utilities.....213
 Public Works.....213
 Purchasing System.....213
 Reichsanstalt.....213
 Research Work.....213
 Routing System.....214
 Scheduling.....214
 Specifications.....214
 Storerooms.....214
 Strikes.....214
 Sugar.....214
 Sugar By-Products.....214
 Tariff.....214
 Time Studies.....214
 Trade Schools.....214
 U. S. Commerce.....214
 Valuation.....215
 Wages.....215
 Wage Systems.....216
 Waste.....216
 Welfare Work.....216
 Workmen's Compensation.....216

MARINE AND NAVAL ENGINEERING

- Anchor Line.....218
 Armor.....218
 Ash discharger.....218
 Ash Expellers.....218
 Auxiliary Units.....218
 Barges.....218
 Battleship Equipment.....218
 Battleships.....218
 Boathouses.....219
 Boats.....219
 Boilers.....219
 Bulkheads.....220
 Canal Boats.....220
 Cargo Ship.....220
 Cargo Steamer.....220
 Cavitation.....220
 Colliers.....220
 Compasses.....220
 Connecting Rods.....220
 Corrugated Ship.....220
 Cruisers.....220
 Cunard Line.....221
 Davits.....221
 Deck-Houses.....221
 Destroyers.....221
 Diesel Engines.....221
 Docking.....221
 Docks.....221
 Dredge Recorder.....221
 Dredges.....222
 Dry Docks.....222
 Electrical Machinery.....222
 Electric Power.....222
 Engine Balancing.....223
 Engine Log.....223
 Engines.....223
 Engine Tests.....223
 Experiment Station.....223
 Ferries.....223
 Ferryboat.....223
 Fireboats.....223
 Fire Extinction.....223
 Fire Extinguishers.....223
 Fishing Steamer.....223
 Fog Signalling.....223
 Freighter.....223
 Fuels.....223
 Gasoline Engines.....224
 Geared Turbines.....224
 German Navy.....224
 Great Lakes.....224
 Guns.....224
 Gyro-Compass.....224
 Hydrography.....224
 Ice Detection.....224
 "Imperator".....224
 Lake Steamers.....224
 Launching.....224
 Launching Devices.....225
 Lifeboats.....225
 Life Saving.....225
 Lighthouses.....225
 Lightship.....225
 Marine Boilers.....225
 Marine Engineering.....225
 Marine Engines.....226
 Marine Paints.....226
 Masts.....226
 Merchantmen.....226
 Model Tank.....226
 Motor Boats.....226
 Motor Ships.....226
 Naval Architecture.....227
 Naval Engineer-ing.....227
 Navigation.....227
 Navy Yards.....227
 Oil Engines.....227
 Oil Fuel.....228
 Olympic.....228
 Pacific.....228
 Periscope.....228
 Plate.....228
 Port Machinery.....228
 Propeller Design.....228
 Propellers.....228
 Propeller Shafts.....229
 Propulsion.....229
 Reinforced Concrete.....229
 Resistance.....229
 Review of 1912.....229
 Rudders.....230
 Safety.....230
 Salvage.....230
 Salving.....230
 Ship Boilers.....230
 Shipbuilding.....230
 Shipbuilding Symbols.....230
 Ship Coaling.....230
 Ship Construction.....231
 Ship Design.....231
 Ship Forms.....231
 Ship Model.....231
 Ship Speed.....231
 Ship Stability.....231
 Ship Ventilating.....231
 Soundings.....231
 Stability.....231
 Stabilizer.....232
 Steam Engineer-ing.....232
 Steamships.....232
 Steam Turbines.....234
 Submarine Mines.....234
 Submarines.....234
 Suction.....234
 Tank Ships.....234
 Tank Steamers.....234
 Terminals.....235
 Torpedo Boats.....235
 Tow-Boats.....235
 Train Ferries.....235
 Transformers.....235
 Transmitter.....235
 Tugboats.....235
 Tugs.....235
 Turbine Gear.....235
 Turbines.....235
 United States Navy.....235
 Ventilation.....236
 Yachts.....236

MECHANICAL ENGINEERING

AERONAUTICS

Aeroplanes	237	Design	238	Hydroplanes	240	Scientific Instru-	
Air Resistance	237	Development	238	Italian <i>Institute</i>	240	ments	241
Airship Fabric	237	Dirigibles	238	Management	240	Seaplane	241
Altitude	237	Engines	239	Meteorology	240	Service	241
Altitude Record-		England	239	Military	240	Speed	241
ing	237	Exhibitions	239	Models	240	Stability	241
Atmosphere	237	Flight	239	Monoplanes	240	Stabilizers	242
Autostable	237	Flying <i>Machines</i>	239	Motor Design	241	Stream Lines	242
Aviation	237	Germany	239	Motors	241	Stresses	242
Biplanes	238	Hangars	239	Propellers	241	United States	242
Catapult	238	Hydro - Aero-		Saint-Cyr	241	Velocities	242
Compasses	238	planes	240			Warfare	242
Control	238						

AUTOMOBILES

Abbott	242	Cycar	246	Grant	252	Partin-Palmer	258
Accelerometer	242	Cyclecars	246	Hampton	253	Pearson-Cox	258
Accumulators	242	Cylinders	246	Havers	253	Pedals	258
Agricultural	242	Daimler	246	Head Lights	253	Petrol-Electric	258
Agricultural Mo-		Darracq	246	Horsepower	253	Peugeot	258
tors	242	Depreciation	246	Hotchkiss	253	Piccard-Pictet	258
Agriculture	243	Design	246	Howard	253	Pistons	258
Alco	243	Details	247	Hupmobile	253	Plows	258
Alda	243	Development	247	Hydraulic <i>Drive</i>	253	Pope-Hartford	259
Ambulances	243	Devices	247	Hydraulic Trans-		<i>Propeller-Shafts</i>	259
Anti-vibrator	243	Differential		mission	253	Racing Cars	259
Argyll	243	Locks	247	Ignition	253	Radiators	259
Armstrong-Whit-		Differentials	247	Imperial	253	R. C. H.	259
worth	243	Economy	247	Inspection	253	Repairs	259
Arrol-Johnston	243	<i>Edwards-Knight</i>	247	Italy	253	Rims	259
A t m o s p h e r i c		Electric Equip-		Keeton	253	Road <i>Resistance</i>	259
Changes	243	ment	247	Kisselkar	253	Road Tests	259
Austro-Daimler	243	Electric Motors	247	La Buire	253	Rolls-Royce	259
Automobile Engi-		Electric Outfits	247	Lighting	254	Rover	259
neers	243	Electric <i>Systems</i>	247	Little	254	Salesrooms	259
Balancing	243	Electric Trucks	247	Locomobile	254	Schacht	259
Batteries	243	Electric <i>Vehicles</i>	247	London	254	Self-Starters	259
Battery Charg-		E. M. F.	248	Lozier	254	Service System	259
ing	243	Empire	248	Lubrication	254	S. G. V.	259
Bayard	243	Engine Bearings	248	Magneto	254	<i>Sheffield-Simplex</i>	259
Bearings	243	Engine Cooling	248	Mail Services	254	Silence	259
Beliet	244	Engine Design	248	Materials	254	Sleeve-Valves	260
Biautogo	244	Engine Efficien-		Maxwell	255	Slide Valves	260
Bodies	244	cies	248	Michigan	255	Spark Plugs	260
Brakes	244	Engines	248	Military	255	Speedometers	260
Cabriolet	244	Engine testing	249	Morris-Oxford	255	Springs	260
Cadillac	244	English <i>Subsidy</i>	249	Motor Cycles	255	Starters	260
Carbon Deposits	244	Equipment	249	Motor Plows	255	Stearns-Knight	260
Carburetion	244	Exhaust	249	Motors	256	Steering	260
Carburetors	244	Exhibitions	249	Motor Truck De-		Steering Gear	260
Care	245	Fiat	250	sign	256	Stoewer	261
Car-Lighting	245	Fire Apparatus	250	Motor Trucks	256	Straker-Squire	261
Chain Drives	245	Fire Trucks	250	Motor Vehicles	257	Studebakers	261
Chalmers	245	F. N.	250	Mud Guards	257	Suspension	261
Chassis Testing	245	Ford	250	Napier	257	Testing	261
Clutches	245	Franklin	250	Nazzaro	257	Tires	261
Coal Fuel	245	Fuels	251	Noise	258	Torque	261
Coasting	245	Fuel Tanks	252	N. S. U.	258	Traction En-	
Cole	245	Garages	252	Nyberg	258	gines	261
Combustion	245	Gasoline Pumps	252	Om nibuses	258	Tractors	261
Commercial Ve-		Gear Changing	252	Om nibus Service	258	Transmission	262
hicles	245	Gear Ratios	252	Opel	258	Valve Gears	262
Control	246	Gears	252	Overland	258	Valves	262
Cooling	246	Germany	252	Packard	258	Wheels	262
Costs	246	Globe	252	Painting	258	Whealey	262
Cost Systems	246					Worm Gear	262

COMBUSTION MOTORS

Cams	262	Engine Tests.....	264	Gases	267	Lubrication	268
Carburetion	262	Engine Troubles.....	264	Gasoline	267	Manograph	268
Combustion	262	Exhibitions	264	Gas Producers.....	267	Oil Engines.....	268
Cooling	262	Flywheels	264	Gas Pumps.....	267	Producer Gas.....	269
Diagrams	262	Fuels	264	Gas Turbines.....	267	Thermal Efficiency	269
Diesel Engines.....	262	Gas Engine	265	Ignition	268	Valves	269
Diesel Motors.....	264	Power	265	Internal Combustion Motors.....	268		
Engine Cooling.....	264	Gas Engines.....	265				
Engines	264						

HEATING AND COOLING

Acoustics	269	District Heating.....	271	Heat Transmis- sion.....	273	Post-Office	274
Air Conditioning.....	269	Draft	271	Hospital Plant.....	273	Practice	274
Air Cooling.....	270	Dust Collecting.....	271	Hospitals	273	Pre-Cooling.....	274
Air Dryers.....	270	Electrical Heat- ers.....	271	Hot Air Heating.....	273	Public Buildings.....	275
Air Ducts.....	270	Electrical Heat- ing.....	271	Hot Blast.....	273	Radiators	275
Air Washing.....	270	Exhaust Steam.....	271	Hot-Water Heat- ing.....	273	Refrigeration	275
Buildings	270	Factories	271	Hot-Water Sys- tems.....	273	School Hygiene.....	276
Central Heating.....	270	Factory Heating.....	271	Houses	273	Schools	276
Central Plants.....	270	Fan Testing.....	272	Humidity	273	School Ventila- tion.....	277
Central Stations.....	270	Foundries	272	Humidity Regu- lator.....	274	Shop Systems.....	277
Cold Storage.....	270	Gas Fires.....	272	Hygiene	274	Steam	277
Combination Plant.....	270	Gas Heating.....	272	Ice-Making	274	Steam Heating.....	277
Combustion Heating.....	270	Greenhouses	272	Ice Plants.....	274	Temperature Con- trol.....	277
Condensing Plants.....	270	Heat Economy.....	272	Indirect Heating.....	274	Temperature Reg- ulators.....	277
Costs	270	Heaters	272	Office Buildings.....	274	Vacuum Heat- ing.....	277
Country Houses.....	271	Heating Prob- lems.....	272	Pipes	274	Ventilation	277
Department Store	271	Heating Systems.....	272				

HYDRAULIC MACHINERY

Accumulators.....	278	Hydraulic Trans- mission.....	280	Pumping Ma- chinery.....	280	Turbine Discs.....	282
Air Lifts.....	278	Hydrodynamics.....	280	Pumping Plant.....	280	Turbine Intakes.....	282
Air Pumps.....	278	Hydrometry	280	Pumps	280	Turbine Pumps.....	282
Centrifugal Pumps.....	278	Instruction	280	Reciprocating Pumps.....	281	Turbines	282
Gas Pumps.....	279	Nozzles	280	Riveters	281	Turbine Speed.....	283
Hydraulic Gears.....	280	Pipe Fittings.....	280	Turbine Bearings.....	281	Turbine Wheels.....	283
Hydraulic Press.....	280	Pumping En- gines.....	280	Turbine Blades.....	281	Valves	283
Hydraulics	280					Water Ram.....	283
						Water Wheels.....	283

MACHINE ELEMENTS AND DESIGN

Alignment	283	Drawings	285	Interchange- ability.....	287	Pattern Shops.....	288
Ball Bearings.....	283	Filletts	285	Keys	287	Piston Rings.....	288
Bearings	284	Gages	285	Keyways	287	Rotary Machines.....	288
Brakes	284	Gear Ratios.....	285	Machine Design.....	287	Shafts	288
Cams	284	Gears	285	Mechanics	287	Springs	288
Connecting Rods.....	284	Gyroscope	287	Models	287	Valve Gears.....	288
Design	284	Gyrostats	287	Pantagraph	287	Valves	289
Dies	285	Hooks	287	Patterns	287	Velocity	289
Drafting	285					Worm Gears.....	289

MACHINE WORKS AND FOUNDRIES

Accident Preven- tion.....	289	Briquetting Ma- chine.....	290	Cleaning Rooms.....	293	Cupola Furnaces.....	294
Accidents	289	Broaches	290	Coils	293	Cupola Practice.....	294
Annealing	289	Bronze Founding.....	290	Cold-Heading.....	293	Cupolas	295
Arbors	290	Cams	291	Copper-Clad Steel.....	293	Cutting Machine.....	295
Axles	290	Case-Hardening.....	291	Copper Found- ing.....	293	Dies	295
Backlash	290	Casting Ladles.....	291	Core-Rooms.....	293	Drilling	295
Brass Founding.....	290	Castings	291	Cores	294	Drilling Ma- chines.....	295
Brass Foundries.....	290	Chain Making.....	293	Cost Estimating.....	294	Drills	295
Brass Furnaces.....	290	Chip Briquetting.....	293	Crucibles	294	Drop-Forgings.....	295
		Chucks	293			Dust Extraction.....	295

MACHINE WORKS AND FOUNDRIES—(Continued)

Enameling	295	Furnace Founda- tions	298	Malleable Foun- dries	303	Safety Appli- ances	307
Exhaust Systems	295	Furnace Fuels	298	Metal Coating	303	Safety Devices	307
Factory Equip- ment	296	Furnace Heating	298	Metal Coloring	303	Sawing Machines	307
Files	296	Furnaces	298	Metal Cutters	303	Saws	307
Finishing	296	Galvanizing	299	Metal Cutting	303	Saw-Sharpening	307
Fire Protection	296	Gauges	299	Milling	303	Screw Machines	307
Forging	296	Gear Cutting	299	Milling Cutters	303	Selection	308
Foundries	296	Grinding	299	Milling Machines	303	Shapers	308
Foundry Fuel	297	Grinding Ma- chines	300	Molding	303	Shears	308
Foundry Heat- ing	297	Guideways	300	Molding Ma- chines	304	Shop Appliances	308
Foundry Labora- tory	297	Hardening	300	Molding Sands	305	Shop Costs	308
Foundry Light- ing	297	Heading Ma- chines	300	Pattern Shop	305	Shop Efficiency	308
Foundry Losses	297	Indexing	300	Pickling	305	Shop Hygiene	308
Foundry Mix- tures	297	Industrial Plants	300	Pipe Cutting	305	Shop Lighting	308
Foundry Opera- tions	297	Ironfoundry	300	Pipe Founding	305	Shop Practice	308
Foundry Power	297	Jarring Ma- chines	300	Pipe Foundry	305	Shops	310
Foundry Prac- tice	297	Jigs	300	Pipe Painting	305	Slotting	312
Foundry Scrap	297	Krupp Centen- nial	300	Planers	305	Special Ma- chines	312
Foundry Shifts	298	Lathe Fittings	301	Pneumatic Ham- mers	305	Special Tools	312
Foundry Train- ing	298	Lathes	301	Pneumatic Tools	306	Tanks	312
Foundry Trans- porters	298	Lathe Work	301	Polishing	306	Tempering	312
Foundry Valua- tion	298	Machine Attach- ments	301	Presses	306	Thermometers	312
Furnace Charg- ers	298	Machinery Pur- chases	302	Press Work	306	Threading	312
		Machine Sup- ports	302	Projectiles	306	Tools	312
		Machine Tools	302	Puddling	306	Type Machine	313
		Machining	302	Reamer-Holders	306	Type Making	313
				Reamers	306	Undulator	313
				Recovery	306	Welding	313
				Repair Shop	307	Wire	315
				Rivetters	307	Wire Drawing	315
				Rolling Mills	307	Woodworking	315
				Rolls	307	Workshops	315
						Work Supports	315

MATERIALS OF CONSTRUCTION

Abrasives	315	Scrap Steel	319	Friction	322	Sieves	325
Alloys	315	Semi-Steel	319	Gages	322	Speeds	325
Alloy Steels	316	Solder	319	Gas Measure- ment	322	Standard Sam- ples	325
Aluminum	316	Steel	319	Hardness	322	Steam Meters	325
Aluminum Alloys	317	Structural Steel	320	Heat Transmis- sion	322	Stresses	325
Boiler Plate	317	Tar	320	Horsepower	322	Stroboscope	325
Boronized Cop- per	317	Tool Steel	320	Hydrometry	323	Tachometry	326
Brass	317	Tungsten	320	Indicators	323	Temperatures	326
Bronzes	317	Vanadium Steel	320	Inertia	323	Test Bars	326
Calcium Carbide	317	Wire	320	Kinematics	323	Testing Ma- chines	326
Carborundum	317	MEASUREMENT		Laboratories	323	Testing Ma- terials	326
Cast Iron	317	Calculator	321	Loads	323	Test Methods	326
Corrosion	317	Calibration	321	Lubricants	323	Test Pieces	326
Fatigue	317	Calorimeters	321	Magnetic Test- ing	323	Tests	326
Fire Bricks	317	Centering	321	Manometers	323	Thermometers	327
Forgings	317	Cinematography	321	Metal Tests	323	Thermometry	327
Galvanized Iron	317	Colorimeter	321	Meters	324	Time Keeping	327
German Silver	318	Colorimetry	321	Metric System	324	Torsion	327
Glass	318	Crankshaft Stresses	321	Oil Tests	324	Torsionmeter	327
Gun-Metal	318	Decimal System	321	Orifices	324	Toughness	327
Iron	318	Diagrams	321	Permeameter	324	Trigonometry	327
Lead	318	Dimensions	321	Pipe Friction	324	Tube Stresses	327
Materials	318	Drafting	321	Pitot Tubes	324	Units of Force	327
Metallography	318	Drawing	321	Pressure Gauges	324	Venturi Meter	327
Metals	318	Dynamometers	321	Pressures	324	Viscometer	328
Micrography	319	Engi- neering Units	322	Prony Brake	324	Weighing Ma- chines	328
Muntz Metal	319	Fatigue	322	Pyrometry	324	Weights	328
Niello	319	Flue Gas Record- ers	322	Rotation	325		
Rode	319						
Rubber	319						
Scrap Metal	319						

POWER AND TRANSMISSION

Air Compressors.....	328	Costs	330	Packing	332	Shafting <i>Losses</i>	334
Air Pump.....	328	Economy	330	Power Costs.....	332	Shafts	334
Bearings	328	Electric Drive.....	330	Power Plants.....	332	Shaft Supports.....	334
Belts	328	Electric Power.....	331	Power-Plant Test-		Shop Plant.....	334
Blower Design.....	329	Gas Power.....	331	ing.....	333	Tidal Power.....	334
Blowers	329	Lubricants	331	Power <i>Resources</i>	333	Turbo-Blowers.....	334
Central Plants.....	329	Lubrication	331	Power Tests.....	333	Turbo-Compress-	
Chain Driving.....	329	Mill Power.....	332	Prime Movers.....	333	sors.....	334
Clutches	329	Motive Power.....	332	Pulleys	333	Vacuum Appara-	
Compressed Air.....	329	Motor Drive.....	332	Rope Cables.....	334	tus.....	334
Compressors.....	330	Natural Powers.....	332	Rope Driving.....	334	Water Power.....	334

STEAM ENGINEERING

Accumulators.....	335	Combustion.....	338	Flue Gas.....	342	Steam	347
Auxiliary Units.....	335	Condensation.....	339	Flues	342	Steam Consump-	
Boiler Cleaning.....	335	Condensers.....	339	Fuel Gas.....	342	tion.....	347
Boiler Construc-		Condenser <i>Tubes</i>	340	Fuel Oil.....	343	Steam Engineer-	
tion.....	335	Cooling Pond.....	340	Fuels	343	ing.....	347
Boiler Corrosion.....	335	Cooling Towers.....	340	Fuel Testing.....	344	Steam Engines.....	347
Boiler Design.....	335	Cylinder <i>Packing</i>	340	Gas-Firing	344	Steam Flow.....	347
Boiler <i>Economy</i>	335	Draft	340	Gauges	344	Steam <i>Jacketing</i>	347
Boiler <i>Efficiency</i>	336	Economies	340	Governors	344	Steam Piping.....	347
Boiler Failures.....	336	Engine Balanc-		Heat Economy.....	344	Steam Plants.....	347
Boiler Houses.....	336	ing.....	340	Indicator Cards.....	344	Steam <i>Pressures</i>	347
Boiler <i>Inspection</i>	336	Engine Design.....	340	Indicator Dia-		Steam Pump.....	347
Boiler Joints.....	336	Engine Dia-		grams.....	344	Stokers	347
Boiler <i>Losses</i>	336	grams.....	340	Indicators	344	Superheating.....	347
Boiler Manage-		Engine Founda-		Intensifiers.....	345	Turbine Blades.....	348
ment.....	336	tions.....	340	Laundries.....	345	Turbine Design.....	348
Boiler Piping.....	336	Engines	341	Locomobile.....	345	Turbine Govern-	
Boiler Plate.....	336	Engine Tests.....	341	Lesses	345	ing.....	348
Boiler Rules.....	336	Engine Valves.....	341	Oil Fuel.....	345	Turbine Plants.....	348
Boilers	336	Evaporators.....	342	Piping	345	Turbines	348
Boiler Scale.....	338	Exhaust Steam.....	342	Piston Rings.....	346	Turbine Wheels.....	350
Boiler Specifica-		Feed Pump.....	342	Smoke	346	Valve Gear.....	350
tions.....	338	Feed Water.....	342	Smoke Preven-		Valves	350
Boiler Tests.....	338	Fireboxes	342	tion.....	346	Waste Heat.....	350
Boiler Waters.....	338	Fitting	342	Stacks	346	Water-Hammer.....	350

TRANSPORTING AND CONVEYING

Aerial Tram-		Conveyors	352	Grain Driers.....	354	Ore Handling.....	354
ways.....	351	Cranes	353	Grain Elevators.....	354	Sand Handling.....	355
Ash Handling.....	351	Dock <i>Machinery</i>	354	Handling System.....	354	Shear-Legs	355
Buckets	351	Elevators	354	Hoisting Hooks.....	354	Telferage.....	355
Cableways	351	Freight Hand-		Mail Railway.....	354	Trippers	355
Coal Handling.....	352	ling.....	354				

MISCELLANY

Acetylene	355	Gas	355	Slings	356	Vacuum Evapo-	
Agricultural Ma-		Guns	356	Standards	356	rators.....	357
chinery	355	Hygiene	356	Tabulating Ma-		Weaving Machi-	
Cotton Mills.....	355	Photography.....	356	chine.....	356	ery.....	357
Ethyl Alcohol.....	355	Plumbing	356	Technical <i>Terms</i>	356	Weighing Ma-	
Expositions	355	Printing	356	Vacuum Clean-		chines.....	357
Flood Effects.....	355	Printing Machi-		ing.....	356		
		ery.....	356				

MINING AND METALLURGY

COAL AND COKE

Accidents	358	Anthracite	359	Bore Holes.....	360	China	360
Alabama	358	Artificial Coal.....	359	Briquettes	360	Classification.....	360
Alaska	358	Austria	359	Briquetting.....	360	Cleaning	360
Alberta	358	Benzol	359	Canada	360	Coal-Cutters.....	360
Analysis	358	Bituminous	359	Charcoal	360	Coal Dust.....	360

COAL AND COKE—(Continued)

Coalfields	361	Coking Plants..	365	Lignite	370	Rules	372
Coal Formation..	362	Collieries	365	Methods	370	Safety Lamps..	372
Coal Gases.....	362	Culm	366	Mine Cave.....	370	Sampling	372
Coal Handling..	362	Cutting Ma-		Mine Fires.....	370	Screening	372
Coal Mining.....	362	chines.....	366	Mine Gases.....	370	Silesia	372
Coal Preparation.....	362	Electric Power..	366	Mining	370	South Africa..	372
Coal Purchasing.....	362	England	367	Mining Methods..	370	Spontaneous Com-	
Coal Stacking..	362	Explosions.....	367	Montana	371	bustion.....	372
Coal Storage.....	362	Firedamp	367	New Zealand..	371	Stoppings	372
Coal Tar.....	362	Flushing	368	Nova Scotia.....	371	Subsidence	373
Coal Trade.....	363	Gas Analysis.....	368	Nystagmus	371	Tar	373
Coke	363	Gases	368	Ohio	371	Taxation	373
Coke Handling..	363	Gas Power.....	368	Operation	371	Tennessee.....	373
Coke-Oven Gas..	363	Gas Producers..	368	Origin	371	Testing Stations..	373
Coke-Oven Prac-		Geology	368	Peat	371	Tipples	373
tice.....	363	Germany	369	Pit Mining.....	371	United States..	373
Coke Ovens.....	364	Gob Fires.....	369	Preparation.....	371	Utah	373
Coke Plants.....	364	Great Britain..	369	Producer Gas...	371	Valuation	373
Coking	364	India	369	Production	371	Vancouver	373
Coking Appli-		Inspection	369	Queensland.....	371	Ventilation	373
cances.....	364	Japan	370	Railroad Claims..	371	Washery	373
Coking By-Prod-		Jigs	370	Refining	372	Weather Fore-	
ucts.....	364	Kansas	370	Regulations.....	372	casting.....	373
		Kentucky	370	Review of 1912..	372	West Virginia..	374
		Legislation	370	Royalties	372	Yukon	374

COPPER

Africa	374	Concentration..	375	Lake Superior..	376	Reduction	377
Alaska	374	Converters.....	375	Leaching	376	Refining	377
Analysis	374	Copper Extrac-		Low-Grade Ores..	376	Reverbera-	
Arctic Coast.....	374	tion.....	375	Metallography..	376	tory Furnace..	378
Argentina.....	374	Copper-Slags...	375	Metallurgy.....	376	Reviews of 1912..	378
Arizona	374	Cost	375	Mexico	376	Roasters	378
Arsenical Cop-		Deoxidation.....	375	Michigan	376	Rock House.....	378
per.....	374	Drilling	375	Montana	376	Russia	378
Assay	374	Electric Power..	375	Nevada	377	Slimes	378
Assaying	374	Electrolytic Re-		New Mexico.....	377	Smelter Flues..	378
Bedding	374	fining.....	375	Nickel-Copper..	377	Smelter Fumes..	378
Blister Copper..	374	Flue Dust.....	375	Nickel - Copper		Smelting	378
British Columbia.	374	Flue Gases.....	376	Ore.....	377	Sulphide Ores..	379
California	375	Fumes	376	Ore Deposits.....	377	Transvaal	379
Canada	375	Geology	376	Precipitation.....	377	Utah	379
Chile	375	Great Falls.....	376	Pyrrhotite	377		

GOLD AND SILVER

Alaska	379	Cyanide Solu-		Idaho	384	Precipitation ..	386
Assaying	379	tions.....	382	Kalgoorlie	384	Purification	386
Australia	380	Cyaniding	382	Klondike	384	Queensland.....	387
Black Sands.....	380	Deep Mining.....	382	Lauder	384	Rand	387
British Columbia.	380	Deposits	382	Low Grade.....	384	Refining	387
California	380	Dredging	382	Mexico	384	Reviews of 1912..	387
Canada	380	Electric Power..	383	Milling	384	Rhodesia	387
Chile	380	Electrolytic Re-		Mills	384	Sampling	387
Cobalt	380	fining.....	383	Montana	384	Silver	387
Colombia	381	Enrichment	383	Nevada	385	Silver-Lead	387
Colorado	381	Geology	383	New Zealand..	385	Slimes	388
Concentration..	381	Georgia	383	Nicaragua	385	South Africa.....	388
Costs	381	Gold Estimation.	383	North Carolina..	385	South Dakota..	388
Cripple Creek..	381	Goldfield, Nev..	383	Nova Scotia.....	385	Sulphide Ores..	388
Cyanidation.....	381	Gold Fields.....	383	Ontario	385	Tonopah.....	388
Cyanide	381	Gold Ores.....	384	Ore Deposits.....	385	Transvaal	388
Cyanide Mills..	381	Grading	384	Peru	386	Veins	388
Cyanide Plants..	381	Grinding Pans..	384	Philippines.....	386	Witwatersrand..	388
		Honduras	384	Placers	386	Yukon	388

IRON AND STEEL

Agglomeration ..	388	Allotropy	389	Alloy Steels.....	389	Annealing	390
Alabama	388	Alloys	389	Analysis	389	Belgium	390

IRON AND STEEL—(Continued)

- Bessemer Process 390
 Bessemer Steel.....390
 Blast - Furnace
 Gases 390
 Practice 391
 Blast Furnaces.....391
 Blast - Furnace
 Slags 392
 Blowing Engines 392
 Canada 392
 Cast Iron.....392
 Charcoal-Iron.....393
 Chile 393
 China 393
 Chrome 394
 Concentration 394
 Concentrator 394
 Converters 394
 Corrosion 394
 Crucible Steel.....394
 Cuba 394
 Cupola Furnaces 394
 Cupolas 394
 Desulphurization 394
 Dry Blast.....394
 Efficiency-Records 394
 Electric Furnaces 395
 Electric Power.....395
 Electrolytic Refining 395
 Electrometallurgy 395
 Flue Dust.....396
 Furnace Firing.....396
 Furnaces 396
 Gas Cleaning.....396
 Geology 396
 Greece 396
 Hardening 396
 Heat Treatment.....397
 India 397
 Ingots 397
 Iron Deposits.....398
 Iron Industry.....398
 Iron Mining.....399
 Iron Sands.....399
 Ironworks 399
 Low-Grade Ores.....399
 Magnetite 399
 Manganese Steel.....399
 Metallurgy 399
 Methods 399
 Michigan 400
 Micrography 400
 Microscopy 400
 Mill Design.....400
 Mining Industry 400
 Minnesota 400
 Missouri 401
 Montreal Mine.....401
 Nevada 401
 Newfoundland.....401
 New York.....401
 Nomenclature 401
 Old Mines.....401
 Ontario 401
 Open-Hearth Furnaces.....401
 Ore Deposits.....402
 Ore Resources.....403
 Ore Sorting.....403
 Pig Iron.....403
 Piping 403
 Production.....403
 Puddling 403
 Pure Iron.....403
 Pyrites 403
 Refining 404
 Reviews of 1912.....404
 Rolling Mills.....404
 Sampling 405
 Silesia 405
 Slag 405
 Smelting 405
 Spain 405
 Steel Mills.....405
 Steel Plants.....405
 Steel Properties.....406
 Steels 406
 Steel Sheets.....407
 Steel Specifications 407
 Steel Tests.....407
 Steel Works.....407
 Sulphides 407
 Tinplate 407
 Tool Steels.....408
 Valuation 408
 Venezuela.....408
 Vermilion Range.....408
 Washing 408
 Wire Drawing.....408
 Wire Mills.....408
 Wrought Iron.....408

LEAD AND ZINC

- Blast Furnaces.....408
 Coeur d'Alene.....408
 Colorado 408
 Concentration 408
 Electric Furnaces 408
 Electric Power.....408
 Electro - Metallurgy 409
 Germany 409
 Graphite 409
 Jcpin 409
 Lead Mill.....409
 Lead Poisoning.....409
 Lead Refining.....409
 Lead Smelting.....409
 New Mexico.....409
 Reduction 409
 Refining 409
 Reviews of 1912.....409
 Smelters 410
 Smelting 410
 Spain 410
 Southern States.....410
 Sulphide Ores.....410
 White Lead.....410
 Wisconsin 410
 Zinc 410
 Zinc Dust.....410
 Zinc Ferrite.....410
 Zinc Metallurgy.....410
 Zinc Mining.....410
 Zinc Ores.....410
 Zinc Production.....410
 Zinc Smelting.....411

MINING

- Accident Prevention 411
 Accidents 411
 Accounting 411
 Africa 411
 Air Control.....411
 Anemometer 411
 Blasting 411
 Bore-Hole Surveying 411
 Canada 411
 Churn Drilling.....412
 Classification.....412
 Compressed Air.....412
 Cost Keeping.....412
 Costs 412
 Detonators 412
 Drainage 412
 Dredges 412
 Drilling 412
 Drills 413
 Earthquakes.....413
 Earth Settlement 413
 Efficiency 413
 Electric Hoisting 413
 Electric Hoists.....413
 Electric Power.....414
 Enrichment 415
 Exhibition 415
 Experimental Station 415
 Exploration 415
 Explosions 415
 Explosives 415
 Filling 416
 Fire Protection.....416
 Fires 416
 Forestry 416
 Framing 416
 Geology 416
 Haulage 417
 Headframes.....417
 Headgears 417
 Hoisting 418
 Hoisting Buckets.....418
 Hoisting Cables.....418
 Hoisting Cages.....418
 Hoisting Engines 418
 Hoisting Ropes.....418
 Hoists 418
 Hydraulic Mining 418
 Hygiene 419
 Illinois 419
 Korea 419
 Labor 419
 Land Laws.....419
 Laws 419
 Machinery 420
 Management.....420
 Maps 420
 Methods 420
 Microscopy 421
 Mine Air.....421
 Mine Buildings.....421
 Mine Calculations 421
 Mine Cars.....421
 Mine Effects.....421
 Mine Examination 421
 Mine Fires.....421
 Mine Lamps.....421
 Mine Locomotives 422
 Mine Motor.....422
 Mine Power.....422
 Mine Pumps.....422
 Miners' Baths.....422
 Mine Switches.....423
 Mine Ties.....423
 Mine Waters.....423
 Mining Bureau.....423
 Mining Hazards.....423
 Mining Plants.....423
 Nationalization.....423
 Ore Deposits.....423
 Pipe Lines.....423
 Props 423
 Prospecting.....423
 Pumping 423
 Quarry Accidents 424
 Quarrying.....424
 Rescue Apparatus 424

MINING—(Continued)

Rescue Appliances..... <u>424</u>	Sampling..... <u>425</u>	South Africa..... <u>426</u>	Tunnels..... <u>427</u>
Rescue Work..... <u>424</u>	Sanitation..... <u>425</u>	Stoping..... <u>426</u>	Unwatering..... <u>427</u>
Roofing..... <u>425</u>	Shafts..... <u>425</u>	Stowing..... <u>426</u>	Valuation..... <u>427</u>
Safety Appliances..... <u>425</u>	Shaft-Sinking..... <u>425</u>	Surveying..... <u>426</u>	Ventilation..... <u>427</u>
Safety Devices..... <u>425</u>	Signalling..... <u>426</u>	Switches..... <u>426</u>	Wages..... <u>428</u>
Safety Lamps..... <u>425</u>	Signals..... <u>426</u>	Taxation..... <u>426</u>	Winding..... <u>428</u>
	Signal Systems..... <u>426</u>	Timbering..... <u>427</u>	Winding Engines..... <u>428</u>

MINOR MINERALS

Alumina..... <u>428</u>	Corundum..... <u>429</u>	Mercury..... <u>430</u>	Phosphate..... <u>433</u>
Aluminum Works..... <u>428</u>	Dolomites..... <u>429</u>	Mica..... <u>430</u>	Phosphate Mining..... <u>433</u>
Amber..... <u>428</u>	Electrometal-lurgy..... <u>430</u>	Natural Gas..... <u>430</u>	Potash..... <u>433</u>
Asbestos..... <u>428</u>	Feldspar..... <u>430</u>	Nickel..... <u>431</u>	Precipitation..... <u>434</u>
Asphalt..... <u>429</u>	Fire-Clay..... <u>430</u>	Nitrates..... <u>431</u>	Pyrophyllite..... <u>434</u>
Bauxite..... <u>429</u>	Garnet..... <u>430</u>	Oil..... <u>431</u>	Pyrrhotite..... <u>434</u>
Bismuth..... <u>429</u>	Gas Fields..... <u>430</u>	Oilfields..... <u>431</u>	Salt..... <u>434</u>
Bitumens..... <u>429</u>	Geology..... <u>430</u>	Oil Industry..... <u>432</u>	Sulphates..... <u>434</u>
Canada..... <u>429</u>	Graphite..... <u>430</u>	Oil Refineries..... <u>432</u>	Sulphides..... <u>434</u>
Carbonaceous Deposit..... <u>429</u>	Gypsum..... <u>430</u>	Oil Wells..... <u>432</u>	Sulphur..... <u>434</u>
Cement..... <u>429</u>	Lime..... <u>430</u>	Ozokerite..... <u>432</u>	Tar..... <u>434</u>
China Clay..... <u>429</u>	Manganese..... <u>430</u>	Petroleum..... <u>432</u>	Tin..... <u>434</u>
Clays..... <u>429</u>	Marble..... <u>430</u>	Petroleum Products..... <u>433</u>	Tungsten..... <u>435</u>

ORE DRESSING AND CONCENTRATION

Agitators..... <u>435</u>	Electric Power..... <u>437</u>	Milling Plants..... <u>439</u>	Smelter Con-tracts..... <u>441</u>
Analysis..... <u>435</u>	Electrochemis-try..... <u>437</u>	Milling Practice..... <u>439</u>	Smelter-Fumes..... <u>441</u>
Australia..... <u>435</u>	Filtration..... <u>438</u>	Mill Operation..... <u>439</u>	Smelters..... <u>441</u>
Automatic Ex-traction..... <u>435</u>	Flotation..... <u>438</u>	Mills..... <u>439</u>	Smelting..... <u>441</u>
Bag-House..... <u>435</u>	Flotation Pro-cesses..... <u>438</u>	Nevada..... <u>439</u>	Sorting..... <u>441</u>
Blast-Roasting..... <u>435</u>	Fumes..... <u>438</u>	Nevada Mill..... <u>439</u>	Sorting Plant..... <u>441</u>
Briquetting..... <u>436</u>	Gold Milling..... <u>438</u>	Ore Testing..... <u>439</u>	Stamp Milling..... <u>441</u>
Chilean Mills..... <u>436</u>	Gold Ore..... <u>438</u>	Parkes Process..... <u>439</u>	Stamp-Mills..... <u>441</u>
Classifiers..... <u>436</u>	Grinding..... <u>438</u>	Phosphate..... <u>440</u>	Tailings..... <u>441</u>
Concentrates..... <u>436</u>	Hydrometal-lurgy..... <u>438</u>	Precipitation..... <u>440</u>	Tailings Dis-posal..... <u>441</u>
Concentrating..... <u>436</u>	Improvements..... <u>439</u>	Progress..... <u>440</u>	Thiogen Process..... <u>442</u>
Concentration..... <u>436</u>	Iron Concen-trators..... <u>439</u>	Recovery..... <u>440</u>	Tin Milling..... <u>442</u>
Conical Mills..... <u>436</u>	Jigs..... <u>439</u>	Reduction..... <u>440</u>	Treatment Waters..... <u>442</u>
Crushers..... <u>436</u>	Korea..... <u>439</u>	Refractories..... <u>440</u>	Tube Mills..... <u>442</u>
Crushing..... <u>437</u>	Melting..... <u>439</u>	Refractory Ore..... <u>440</u>	Volatilization..... <u>442</u>
Cyanide Plants..... <u>437</u>	Milling..... <u>439</u>	Republic, Wash..... <u>440</u>	Waste..... <u>442</u>
Cyanide Process..... <u>437</u>		Sampling..... <u>440</u>	
Cyaniding..... <u>437</u>		Silver Milling..... <u>440</u>	
Desulphurizing..... <u>437</u>		Sintering..... <u>440</u>	
		Slimes..... <u>440</u>	

RARE MINERALS

Amber..... <u>442</u>	Nova Scotia..... <u>443</u>	Radium..... <u>443</u>	Tungsten..... <u>443</u>
Diamonds..... <u>442</u>	Pitchblende..... <u>443</u>	Rhodesia..... <u>443</u>	Uranium..... <u>443</u>
Gems..... <u>442</u>	Platinum..... <u>443</u>	Sapphires..... <u>443</u>	Wolframite..... <u>443</u>
Iridium..... <u>442</u>	Queensland..... <u>443</u>	Tellurium..... <u>443</u>	Zircon..... <u>444</u>
Lithium..... <u>443</u>			

MISCELLANY

Address..... <u>444</u>	British Colum-bia..... <u>445</u>	Crystallography..... <u>445</u>	Investors..... <u>446</u>
Africa..... <u>444</u>	Bulgaria..... <u>445</u>	Dutch Indies..... <u>446</u>	Japan..... <u>446</u>
Agricola..... <u>444</u>	Bureau of Mines..... <u>445</u>	Egypt..... <u>446</u>	Korea..... <u>446</u>
Alaska..... <u>444</u>	Canada..... <u>445</u>	Fritz, John..... <u>446</u>	Lake Superior..... <u>446</u>
Ancient Mines..... <u>444</u>	Colorado..... <u>445</u>	Geology..... <u>446</u>	Land Classifica-tion..... <u>446</u>
Australasia..... <u>444</u>	Columbia..... <u>445</u>	Georgia..... <u>446</u>	London..... <u>447</u>
Austria..... <u>444</u>	Conservation..... <u>445</u>	Germany..... <u>446</u>	Madagascar..... <u>447</u>
Bohemia..... <u>444</u>	Court Decision..... <u>445</u>	Holland..... <u>446</u>	Malay States..... <u>447</u>
Bolivia..... <u>444</u>	Cripple Creek..... <u>445</u>	Hot Springs..... <u>446</u>	Manitoba..... <u>447</u>
Brazil..... <u>444</u>		Idaho..... <u>446</u>	

MISCELLANY—(Continued)

- Metallurgy 447
 Metal Production 447
 Mexico 447
 Microscopy 447
 Mineral Lands 447
 Mineralogy 447
 Mining Congress.....447
 Mining Industry.....447
 Mining Stocks.....447
 Natural Resources 447
 Nevada 448
 New Mexico.....448
 New York.....448
 Nova Scotia.....448
 Oil Refinery.....448
 Ore Deposits.....448
 Philippines 448
 Production 448
 Public Lands.....448
 Queensland 448
 Review of 1912.....448
 Rock Compo-
 nents 448
 Russia 448
 South America.....448
 South Dakota.....448
 Southern States.....449
 Sulphuric Acid.....449
 Tunis 449
 Turkistan 449
 United States.....449
 Virginia 449
 Wisconsin 449

RAILWAY ENGINEERING

CONDUCTING TRANSPORTATION

- Acceleration 450
 Accidents 450
 Administration 450
 Africa 450
 Automatic Stops.....450
 Braking 450
 Collisions 450
 Control 451
 Derailment 451
 Despatching 451
 Efficiency 451
 European Prac-
 tice 451
 Facilities 451
 Flagging 451
 Freight Trains.....451
 Interlocking 451
 Operation 451
 Prussia 452
 Railophone 452
 Refrigeration 452
 Safety 452
 Safety work.....452
 Schedules 452
 Signaling 452
 Speed 453
 Summer Ser-
 vices 453
 Telephone De-
 spatching 453
 Ticket Printing.....453
 Ticket Selling.....453
 Train Control.....453
 Train Crews.....454
 Train Service.....454
 Train Stop.....454
 Transport 454
 Transportation.....454

MOTIVE POWER AND EQUIPMENT

- Accumulator
 Traction 451
 Aerial Tram-
 ways 451
 Air Brakes.....451
 Axleboxes 455
 Boiler Inspec-
 tion 455
 Box Cars.....455
 Brakes 455
 Braking 456
 Car Building.....456
 Car Cleaning.....456
 Car Construc-
 tion 456
 Car Floors.....456
 Car Heating.....456
 Car Inspection.....456
 Car Lighting.....456
 Car Material.....456
 Car Painting.....456
 Car Repairs.....456
 Car Roofs.....457
 Cars 457
 Car Trucks.....457
 Car Ventilation.....457
 Connecting Rods.....457
 Control Valves.....457
 Couplers 458
 Coupling 458
 Coupling Rods.....458
 Deck Shields.....458
 Draft Gear.....458
 Driving Box.....458
 Dynamometer
 Cars 458
 Electric Locomo-
 tives 458
 Electric Trac-
 tion 458
 Electrification 458
 Equipment Cost.....461
 Feed-Water 461
 Fireboxes 461
 Freight Cars.....461
 Fuel 461
 Fuel Economy.....462
 Funiculars 462
 Headlights 462
 Indicators 462
 Inspection Cars.....462
 Locomotive
 Boilers 462
 Locomotive Build-
 ing 463
 Locomotive Com-
 bustion 463
 Locomotive Cyl-
 inders 463
 Locomotive De-
 sign 463
 Locomotive Effi-
 ciency 463
 Locomotive Fire-
 boxes 463
 Locomotive
 Frames 463
 Locomotive Fuel.....463
 Locomotive Haul-
 age 463
 Locomotive
 Loads 463
 Locomotive Lu-
 bricants 464
 Locomotive Per-
 formance 464
 Locomotive Prac-
 tice 464
 Locomotive Re-
 pairs 464
 Locomotives 464
 Locomotives (Ar-
 ticulated) 466
 Locomotives (At-
 lantic) 467
 Locomotives
 (Diesel) 467
 Locomotives
 (Electric) 467
 Locomotives
 (Mikado) 468
 Locomotives (Pa-
 cific) 469
 Locomotive Se-
 lection 469
 Locomotive Su-
 perheaters 469
 Locomotive Test-
 ing 469
 Locomotive
 Valves 469
 Lubrication 469
 Mechanical Stok-
 ers 470
 Mine Locomo-
 tives 470
 Motor Cars.....470
 Multiple-Unit 470
 Official Records.....471
 Oil Engines.....471
 Passenger Cars.....471
 Power Resources.....471
 Refrigerator
 Cars 471
 Relief Trains.....471
 Repair 471
 Repair Shops.....471
 Safety Valves.....471
 Shop Practice.....471
 Shops 471
 Smoke 472
 Smoke Preven-
 tion 472
 Snow Plows.....472
 Steam Consump-
 tion 472
 Steel Cars.....472
 Stokers 472
 Stores 472
 Superheaters 472
 Superheating 475
 Tires 473
 Tractive Effort.....473
 Tractors 473
 Train Lighting.....473
 Train Resistance.....473
 Transfer Trucks.....473
 Triple Valves.....473
 Valve Gears.....473
 Valve Tests.....474
 Vestibules 474
 Wheels 474
 Wheel Tests.....474

NEW PROJECTS

- Africa 474
 Alaska 474
 Algeria 474
 Alpine Railway.....474
 A. T. & S. F.
 Ry. 474
 Austria 475
 Bagdad Railway.....475
 Boston & Maine.....475
 Canada 475
 Canadian Ry.....475
 C. C. & O.....475
 China 475
 C. M. & St. P.....475
 Cut-Off 475
 D. L. & W. Ry.....475

NEW PROJECTS—(Continued)

East Africa..... 476	Hudson Bay Project..... 476	Milwaukee..... 477	Southern Rail-roads..... 477
Egypt..... 476	Idaho-Northern..... 476	Mittenwald..... 477	Switzerland..... 477
E. P. & S. W..... 476	Ireland..... 476	New York Central..... 477	Trono Railway..... 477
Erie..... 476	Italy..... 476	Norfolk Southern..... 477	Tunnel Railway..... 477
Grand Trunk..... 476	K. C. Southern..... 476	Pennsylvania R. R..... 477	West Africa..... 477
Hamilton, Ont..... 476	Long Island R. R..... 476		West Virginia..... 477
Himalayan Line..... 476	Louisville & Nashville..... 476		
Himalayas..... 476			

PERMANENT WAY AND BUILDINGS

Accidents..... 477	Feeders..... 479	Rail Bonding..... 481	Ties..... 485
Avalanche Construction..... 478	Flood Damage..... 479	Rail Corrosion..... 481	Tool Houses..... 486
Ballast..... 478	Floods..... 479	Rail Failures..... 481	Track Appliances..... 486
Buffer..... 478	Freight Houses..... 479	Rail Inspection..... 481	Track Circuits..... 487
Buildings..... 478	Freight Terminals..... 479	Rail Joints..... 481	Track Elevation..... 487
Cable Railways..... 478	Gauges..... 479	Rails..... 481	Track Labor..... 487
Car-Bumpers..... 478	Grade Crossings..... 479	Rail Tests..... 482	Track Material..... 487
Chicago..... 478	Grade Reduction..... 480	Report Systems..... 482	Tracks..... 487
Classification..... 478	Grades..... 480	Right of Way..... 482	Track Scales..... 487
Yards..... 478	Grading..... 480	Roadway..... 482	Track Tanks..... 488
Coaling Stations..... 478	Grand Central Terminal..... 480	Roundhouses..... 482	Tunnels..... 488
Concrete..... 478	Guard Rails..... 480	Sheds..... 482	Turntables..... 488
Concrete Buildings..... 478	Improvements..... 480	Shops..... 482	Utica, N. Y..... 488
Construction..... 478	Inspection..... 480	Standardization..... 482	Water Service..... 488
Construction Organization..... 478	Junctions..... 480	Stations..... 483	Water Stations..... 488
Curves..... 478	Labor..... 480	Structures..... 483	Water Tanks..... 488
Deterioration..... 479	Location..... 480	Subway Construction..... 483	Water Towers..... 488
Drainage..... 479	Maintenance..... 481	Switches..... 483	Water Troughs..... 488
Earthwork..... 479	Mono-Railway..... 481	Terminals..... 483	Widening..... 488
Embankments..... 479	Rack Railways..... 481	Testing Plant..... 485	Yards..... 488
	Rail Anchors..... 481	Tie-Adzing..... 485	

TRAFFIC

Agriculture..... 489	Freight..... 489	N. Y., N. H. & H..... 490	Registering Machines..... 491
Annual Reports..... 489	Freight Cars..... 489	Ore Transport..... 490	Regulation..... 491
Bulgaria..... 489	Freight Handling..... 490	Parcel Post..... 490	Regulations..... 491
Capitalization..... 489	Freight Terminals..... 490	Railway Economics..... 491	South Africa..... 492
City Traffic..... 489	Hungary..... 490	Railway Problems..... 491	Statistics..... 492
Clearing House..... 489	Interchange..... 490	Railway Situation..... 491	Tonnage..... 492
Coal Cars..... 489	Interstate Commerce..... 490	Rate Regulation..... 491	United States..... 492
Earnings..... 489	Long Runs..... 490	Rates..... 491	Valuation..... 492
Economics..... 489	Mail Rates..... 490	Records..... 491	Wages..... 493
Efficiency..... 489	Merger Case..... 490		Warehouse Trucks..... 493
Express Handling..... 489			Weighing..... 493
Express Rates..... 489			

MISCELLANY

African Railways..... 493	Dutch East Indies..... 494	Great Western Ry..... 494	Railroad Contracts..... 495
Alaska..... 493	Education..... 494	India..... 494	Railway Museum..... 495
Bolivia..... 493	England..... 494	Mexican Railways..... 494	Regulation..... 495
Canada..... 493	Examinations..... 494	Peru..... 494	Review of 1912..... 495
Capitalization..... 493	Forests..... 494	Public Ownership..... 494	Storekeepers' Assn..... 495
Conservation..... 493	France..... 494	Queensland..... 494	Waste..... 495
Convention..... 493	Germany..... 494		
Dissolution..... 494			

STREET AND ELECTRIC RAILWAYS

Accident Prevention..... 496	Accumulator Cars..... 496	Accumulator Traction..... 496	Axles..... 496
Accidents..... 496	Accumulators..... 496	Australia..... 496	Bearings..... 496
Accounting..... 496		Automotrice..... 496	Berlin..... 496
			Boston Elevated..... 497

STREET AND ELECTRIC RAILWAYS—(Continued)

Brakes 497	Fares 500	Oil System.....502	Sheffield, Eng...504
Buenos Aires...497	Feeders 500	Operating Ex-	Shop Practice...504
Cable Laying...497	Feeder Tests...500	pense.....502	Shops 506
California.....497	Field Control...500	Operation 502	Signaling 505
Canada 497	Finance 500	Oregon 503	Single Phase....505
Car Design.....497	France 500	Panama 503	South Carolina..505
Car Equipment.497	Freight 500	Parcel Carrying.503	Spain 506
Car-Ferries....497	Funeral Cars...500	Paris 503	Standardization.506
Car Heating....497	Grades 500	Paving Mainten-	St. Louis.....506
Carhouses 497	Great Britain..500	ance.....503	Substations 506
Car Lighting...498	Hamburg 500	Peak Loads....503	Subways 506
Cars 498	High Tension...501	Philadelphia...503	Subway Stations.506
City Service...498	Holland 501	Power Genera-	Switzerland 506
Chicago 498	Inspection 501	tion.....503	Terminals 507
Cleveland, O...499	Instructions....501	Power Plant...503	Three-Phase....507
Composite Rails.499	Interurban 501	Power Stations..503	Tires 507
Congestion 499	Italy 502	Providence, R.I.504	Tracks 507
Connecticut	Load Factor....502	Rail Corrugation.504	Traction 507
Lines.....499	London 502	Rail Grinding...504	Traffic 507
Constantinople..499	Lubrication 502	Railless 504	Traffic Methods..507
Construction ...499	Maintenance...502	Rails 504	Trolley 508
Control 499	Management...502	Railway econom-	Trolley Designs.508
Controllers 499	Mine Effects...502	ics.....504	Trolley Lines...508
Costs 499	Motors 502	Rapid Transit..504	Valuation 508
Dynamotor Com-	Newcastle, Eng.502	Repair Shops...504	Warsaw 508
pressor.....499	New South	San Francisco...504	Westphalia.....508
Electric Traction.499	Wales.....502	Schedules 504	Wheels 508
Europe 500	New York, West-	Seattle 504	Wiring 508
Express Service.500	chester and		
Fare Collection..500	Boston 502		

ORIGINAL ARTICLES SUPPLIED

We hold ourselves ready to supply—if not out of print—the full text of every article indexed in this volume, *in the original language*, together with all accompanying illustrations; and our charge in each case is regulated by the cost of a single copy of the journal in which the article is published. The price of each article is indicated by the letter following the number. When no letter appears, the price of the article is 20 cents. The letter A, B or C denotes a price of 40 cents; D, of 60 cents; E, of 80 cents; F, of \$1.00; G, of \$1.20; H, of \$1.60. When the letter N is used it indicates that copies are not readily obtainable, and that particulars as to price will be supplied on application. Certain journals, however, make large extra charges for back numbers. In such cases we may have to increase proportionately the normal charge given in the INDEX. In ordering, care should be taken to *give the number* of the article desired, not the title alone.

To avoid the inconvenience of letter-writing and small remittances, especially from foreign countries, and to cheapen the cost of articles to those who order frequently, we sell coupons at the following prices:—20 cents each, or book of twelve for \$2.00, three books for \$5.00.

Each coupon will be received by us in payment for any 20-cent article catalogued in the INDEX. For articles of a higher price, one of these coupons will be received for each 20 cents; thus, a 40-cent article will require two coupons; a 60-cent article, three coupons, and so on. The use of these coupons is strongly commended to those who use the INDEX regularly. They not only reduce the cost of articles 25 per cent (from 20 cents to 15 cents), but they need only a trial to demonstrate their very great convenience—especially to engineers in foreign countries, or away from libraries and technical club facilities.

Write for a sample coupon—free to any part of the world.

THE ENGINEERING INDEX

1913

CIVIL ENGINEERING

BRIDGES	25	ROADS AND PAVEMENTS	79
CONSTRUCTION	37	WATER SUPPLY	92
MATERIALS OF CONSTRUCTION...	53	WATERWAYS AND HARBORS.....	115
MEASUREMENT	63	MISCELLANY	128
MUNICIPAL	68		

Abutments

Abutments

A Novel Design for a High Abutment. E. F. Ackerman. Illustrated description of a structure on the Lehigh Valley R. R. in Pennsylvania. 1200 w. Ry Age Gaz—March 28, 1913. No. 40945.

Points Concerning Reinforced Concrete Abutments. H. R. Mackenzie. The discussion is confined to abutments supporting truss bridges. 3000 w. Ap Sci—June, 1913. No. 43765 C.

The Design of a Reinforced Concrete Abutment. H. R. Mackenzie. An investigation of the design from the standpoint of theoretical formulæ. Ills. 3300 w. Can Engr—July 31, 1913. No. 44145.

Skeleton Abutment of Reinforced Concrete for a Steel Bridge at South Lorain, Ohio. T. L. Gibson. Sketches with brief description. 700 w. Engng & Con—July 9, 1913. No. 43612.

The Design of Concrete Abutments Without Wing Walls for Deck Girders. C. M. Luther. Drawings and discussion of important factors entering into designs. 1200 w. Eng News—Oct. 23, 1913. No. 46159.

See also Concrete, under RAILWAY ENGINEERING, *Permanent Way and Buildings*.

Arches

Construction of a Long Concrete Arch Bridge in Spokane, Washington. J. F. Greene. Illustrated description of a 7-span structure 940 feet long between abutments, erected over Latah Creek. 2500 w. Eng Rec—March 22, 1913. No. 40764.

The Crooked River Bridge, Oregon. Clement E. Chase. Illustrated description of the design and erection of a spandrel-

BRIDGES

Arches

braced two-hinged arch on the Oregon Trunk Ry. 3500 w. Eng News—March 20, 1913. No. 40737.

The Crooked River Arch Bridge. Illustrated description of a structure on the Oregon Trunk line, having features of unusual interest. 1200 w. Ry Age Gaz—Feb. 28, 1913. No. 40242.

Tower Street Arch Bridge at Fergus. A. W. Connor. Illustrated description of a recently completed reinforced-concrete arch over the Grand River. 1000 w. Can Engr—April 24, 1913. No. 41677.

Colorado Street Bridge Over Arroyo Seco. E. E. Howard. Illustrated description of a concrete arch structure with curved alignment at Pasadena, Cal. 2500 w. Eng Rec—May 24, 1913. No. 42374.

Overhead Highway Arch of Artistic Design. A. M. Wolf. Illustrates and describes a reinforced concrete highway arch bridge over the tracks of the N. Y., N. H. & H. R. R. at South Park, Fall River, Mass. 1500 w. Ry Engng & Main of Way—June, 1913. No. 42976.

Morris County Turnpike Arch at Hopatcong, N. J. D. L. & W. R. R. A. M. Wolf. Illustrated description of a circular segmental arch carrying three tracks. 1200 w. Ry Engng & Main of Way—Sept., 1913. No. 45174.

The Carondelet Park Bridge, St. Louis, Mo. Charles W. Martin. Illustrated description of the design and construction of a flat circular arch of reinforced concrete. 2000 w. Eng News—Oct. 2, 1913. No. 45649.

Stone Arch at Pelham, N. Y. Henry B. Seaman. Illustrated description of an elliptical arch designed to carry a four-track railroad and to conform to the pro-

Consult Classification of the Index. See page 9.

Arches

posed development of a residential park. Discussion. 2000 w. Brooklyn Engrs' Club—1913. No. 46399 N.

Method of Constructing a Three-Span Skew Arch Bridge Using Steel Centers. Illustrated description of a concrete bridge at Pittsburgh. 2000 w. Engng & Con—Feb. 19, 1913. No. 39934.

The 523½ Ft. Steel Arch Bridge Over the Sanaga River, Cameroon, South Africa. K. A. Muellenhoff. Compares the structures over the Zambesi and the Sanaga rivers, and gives an illustrated description of the latter. 3000 w. Eng News—Dec. 26, 1912. No. 38588.

Highway Bridge With 200-Metre Arched Span (Pont-route en arc, de 200 mètres d'ouverture). Ch. Dantin. Detailed description of the new bridge at Le Roche-Bernard, over the Vilaine river. Ills. and plates. 6400 w. Génie Civil—Nov. 16, 1912. No. 38489 D.

The Failure of the Arch Framing of the Val Mela Viaduct on the Bevers-Schuls Branch of the Rhaetian Railway (Zum Gerüstesturz des Val Mela-Viadukts auf der Linie Bevers-Schuls der Rhätischen Bahn). Abstracts from the report on the cause of failure by R. Weber and S. Grosjean. Ills. 3000 w. Schweiz Bau—Nov. 23, 1912. No. 38436 D.

Test-Loading Until Breaking Point of a 100-Foot Arch Bridge. V. J. Elmont. Explains circumstances which made it possible to make this test at Düsseldorf, Germany, and gives illustrated report of methods and results. 3000 w. Can Engr—May 22, 1913. No. 42394.

Calculations on Continuous Arch Beams (Beitrag zur Berechnung kontinuierlicher Bogenträger). Karl Federhofer. Graphical and mathematical discussion. Ills. 3300 w. Schweiz Bau—Nov. 23, 1912. No. 38435 D.

The Design of Arched Slabs (Berechnung gewölbter Platten). Huldreich Keller. Studies on stresses in masonry arches. Diagrams. Serial, 1st part. 2000 w. Schweiz Bau—Mar. 1, 1913. No. 40532 D.

Design of an Arch System by the Method of the Ellipse of Elasticity. A. C. Janni. Presents a graphical method and its application to the design of the Kings-highway viaduct in St. Louis. General discussion. 16000 w. Jour W Soc of Engrs—May, 1913. No. 42923 D.

The Determination of Internal Temperature Range in Concrete Arch Bridges. C. S. Nichols and C. B. McCullough. Report of experimental investigations and results, with conclusions. Ills. 101 pp. Bul No. 30, Iowa State

BRIDGES

College of Agri and Mech Arts—Jan., 1913. No. 43758 N.

See Reconstruction, Concrete, Constantine and Viaducts, under *Bridges*; Stresses, under *Measurement*; and Reinforced Concrete and Arch Design, under *Construction*.

Bascule

A Rolling Lift Bridge, 186 Ft. Long. Illustrates and describes details of a bascule type structure with a concrete counterweight, near South Chicago, Ill. 1100 w. Ir Age—Jan. 30, 1913. No. 39586 C.

Lift Bridges Over the Buffalo River. Emil Low. Illustrated description of the construction of three movable bridges replacing fixed spans to allow navigation. 4000 w. Ry Age Gaz—Jan. 31, 1913. No. 39597.

A Temporary Drawbridge of the Horizontal Rolling Type. Illustrated description of a structure for foot passengers, erected over the Milwaukee River, Milwaukee, Wis., to be used during the construction of the Oneida st. bascule bridge. 1000 w. Eng News—Jan. 30, 1913. No. 39591.

Lift Bridges of Milwaukee. Henry G. Tyrrell. Illustrates and describes types and gives information. 2500 w. Munic Engrg—July, 1913. No. 44032 C.

Bascule Bridges. H. G. Tyrrell. Illustrates and describes types. 3500 w. Can Engr—March 13, 1913. No. 40677.

Trunnion Bascule Bridges with Fixed Counterweights. Henry Grattan Tyrrell. Information concerning early designs, describing their form, design operation, etc. Ills. 3500 w. Engng & Con—April 16, 1913. No. 41274.

Traversing Bridges. Henry Grattan Tyrrell. A discussion of a variety of forms. 7500 w. Engng & Con—June 4, 1913. No. 42665.

Bascule Bridges. A general account of recent designs evolved by the Strauss Bascule Bridge Co., of Chicago. Ills. 3500 w. Engr, Lond—March 28, 1913. No. 41147 A.

Specifications for Metal Railroad Bridges Movable in a Vertical Plane. Continued discussion of B. R. Leffler's paper. 15000 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41315 F.

A Small Bascule Highway Draw Span. L. E. Moore. Illustrated description of a draw-span costing about \$2000, operated by hand. 2000 w. Jour Assn of Engng Socs—June, 1913. No. 43245 C.

Direct-Lift-Drawbridges without Cables. Two articles illustrating and describing different designs for a new type of drawbridge in which the span is raised

Bascule

vertically without cables. 2500 w. Eng News—June 5, 1913. No. 42698.

A Double-Deck Bascule Bridge. Drawings and description of a bridge to be built over the Chicago River at Michigan Ave. 1200 w. Eng News—July 17, 1913. No. 43839.

City Waterway Bridge, Tacoma. Brief illustrated description. 1000 w. Engng—July, 1913. No. 44047 C.

The Design of a Small Bascule Highway Draw Span. Illustrated description of a bridge operated by hand. 2000 w. Engng & Con—Aug. 13, 1913. No. 44348.

Double Deck Bascule Bridge. Illustrated description of the design and construction of such a bridge at Fort William, Ont. 1000 w. Ry Age Gaz—Oct. 3, 1913. No. 45660.

Illinois River Bridge, St. L., P. & No. W. Ry. Illustrated description of a recently completed single-track bridge at Pekin, Ill., with vertical lift through truss span. 3000 w. Ry Engng & Main if Way—Oct., 1913. No. 45896.

Boston

Notes on the Construction of the Charles River Bridge; East Cambridge Extension of the Boston Elevated Railway Company. Clarence T. Fernald. Illustrated description, showing the construction methods pursued, some of the difficulties encountered, and the final results obtained in erecting this bridge. 4500 w. Jour Assn of Engng Soc—Nov., 1912. No. 37533 C.

Cairo

New Bulak Bridge at Cairo. Illustrated description of this new bridge over the Nile, with a Scherzer rolling lift opening span. 2500 w. Engr, Lond—Oct. 17, 1913. No. 46249 A.

Canada

Early Canadian Bridge-Building. H. G. Tyrrell. Brief illustrated description of structures of the timber, pontoon, and suspension types. 1500 w. Con Rec—April 30, 1913. No. 42068.

See also Quebec and St. Lawrence, under *Bridges*.

Cantilevers

The Sewickley Cantilever Bridge. Illustrates and describes interesting features of the design and erection of this bridge over the Ohio River, near Pittsburgh. 3500 w. Eng News—Feb. 27, 1913. No. 40235.

The Sewickley Bridge over the Ohio (Le Pont de Sewickley, sur l'Ohio). Alfred Jacobson. Brief general description of the bridge, and outline of the mode of erection adopted in its construction. Ills. and Plate. 1700 w. Genie Civil—Aug. 2, 1913. No. 45344 D.

BRIDGES

Concrete

Reinforcing an Old Cantilever Bridge, Philadelphia, Penn. Henry H. Quimby. Illustrates and describes an interesting old highway bridge and the scheme of reinforcement. 2000 w. Eng News—Sept. 11, 1913. No. 45068.

See Suspension, under *Bridges*.

Chain

The Reconstruction of the Old Chain Bridge at Newburyport, Mass. Edward C. Sherman. Gives the history of this old bridge, built in 1810, and describes its reconstruction in 1913 to meet new requirements. Ills. 900 w. Eng. News—Sept. 25, 1913. No. 45486.

China

New Bridge Over the Hwang Ho (Yellow River). Illustrated description of the construction of one of the most important bridges in the Far East, on the line of the Tientsin-Pukow Ry. 2000 w. Ry Gaz, Lond—Feb. 7, 1913. No. 39909 A.

A Chinese Railway Bridge. F. C. Coleman. Illustrations and brief description of the erection of a bridge across the Hwang Ho River. With the exception of the pier in the middle of the stream, the whole bridge is carried by reinforced concrete piles. 1200 w. Sci Am Sup—March 22, 1913. No. 40749.

Cologne

Close Competition in the Designs for a Highway Bridge over the Rhine at Cologne (Engerer Wettbewerb um den Entwurf einer Strassenbrücke über den Rhein bei Köln). Karl Bernhard. Reviews conditions placed, and presents some of the 30 designs submitted. Ills. Serial, 1st part. 3000 w. Zeit des Ver deutscher Ing—July 12, 1913. No. 44647 D.

Concrete

The Present Status of Bridge Building. Frank P. McKibben. Illustrates and describes types of concrete construction. 2500 w. Concrete-Cement Age—Dec., 1912. No. 38151.

Patented Concrete Bridges. Daniel B. Luten. A lecture on this subject, with illustrations of designs, and general discussion. 7000 w. Jour Am Soc of Engng Con—Oct., 1912. No. 38556 C.

Concrete Bridges and Viaducts. A. M. Wolf. Illustrates and describes representative American highway and railway bridges and track elevation structures. 10000 w. Ry Engng & Main of Way—Jan., 1913. No. 39278.

New Delaware River Bridge at Yardley, Pa. E. Chamberlain. Illustrated description of a recently completed double track concrete arch bridge on the Philadelphia & Reading Ry. 4000 w. Ry

Concrete

Engng & Main of Way—March, 1913. No. 40788.

The Latah Creek Bridge, Spokane Wash. J. F. Greene. Illustrated description of a large concrete bridge of pleasing design under construction. 2000 w. Eng News—March 27, 1913. No. 46939.

New Delaware River Bridge of the P. & R. Edwin Chamberlain. Illustrated description of a double-track concrete arch structure nearing completion at Yardley, Pa. 4000 w. Ry Age Gaz—April 25, 1913. No. 41640.

Bush and Gunpowder River Bridges. Illustrates and describes the longest concrete slab bridges in America, on the line between Philadelphia and Washington. 4500 w. Ry Engng & Main of Way—July, 1913. No. 43769.

Concrete Bridges: Some Important Features in Their Design. Walter M. Smith, Sr. and Walter M. Smith, Jr. Illustrates and describes important features in some concrete bridges recently designed by the writers. 3500 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44781 F.

Girder Bridge Encased in Concrete Over Prison Point St., East Cambridge, Mass. Drawings and description of an artistic structure. 600 w. Engng & Con—Aug. 13, 1913. No. 44347.

Artistic Masks for Ugly Bridges. Illustrated description of unsightly plate-girders encased in ornamental concrete. 1000 w. Eng Rec—Oct. 11, 1913. No. 45810.

Concrete Bridge and Roadway Improvement at Mount Airy. J. C. Meems. Illustrates and describes the road and bridge improvements on this Virginia property. 2000 w. Brooklyn Engrs' Club—1912. No. 46394 N.

Concrete Railroad Bridges of Three Different Types. A. M. Wolf. Illustrated description of a plate girder bridge with concrete portal, a solid spandrel arch bridge, and an overhead highway bridge of flat slab construction. 2500 w. Ry Engng & Main of Way—Oct., 1913. No. 45897.

See also Arches and Abutments, Reinforced Concrete and Viaducts, under *Bridges*.

Constantine

The New Bridges at Constantine, Algeria (Les nouveaux ponts de Constantine, Algerie). The construction of the Sidi Rached arch and approaching viaducts. Ills. 2800 w. Genie Civil—March 1, 1913. No. 40597 D.

Construction

Notes on Bridgework. Continued discussion of paper by S. Vilar Y. Boy. 1500

BRIDGES

w. Pro Am Soc of Civ Engrs—Feb, 1913. No. 40171 F.

Culverts

Methods and Cost of Constructing a Combination Corrugated Pipe and Concrete Culvert With Some Data on Corrugated Pipe Culverts With Concrete End Walls. John N. Edy. Ills. 1100 w. Engng & Con—Jan. 1, 1913. No. 38768.

Data for Use in Designing Culverts and Short-Span Bridges. Charles H. Moorehead. Suggestions and preliminary data for use in designing highway culverts and short-span masonry bridges. Ills. 8000 w. U S Dept of Agri, Bul 45—Feb. 20, 1913. No. 40427 N.

Cost of Constructing Concrete Culverts Under Canal in Sevier County, Utah. James Jensen. Gives costs of construction of reinforced concrete culverts to carry flood waters under the canal. 3000 w. Engng & Con—April 23, 1913. No. 41587.

Concrete Culverts for Country Roads. C. R. Thomas and T. F. Hickerson. Extracts from a recent bulletin issued by the N. C. Geol. & Ec. Survey. Gives information pertaining to the design and construction of concrete waterways for country roads. Ills. 2000 w. Can Engr May 22, 1913. No. 42395.

A Rational Culvert Formula. W. W. Horner. Gives formula for culvert size based on data used in sewer design in St. Louis. 800 w. Eng News—May 1, 1913. No. 41866.

Concrete Culverts. F. H. McKechnie. Deals with points to be considered before deciding on size, style or shape of culvert to be used. Ills. 1500 w. Can Engr—June 5, 1913. Serial. 1st part. No. 42688.

Waterman Avenue Culvert, over River des Peres, St. Louis, Mo. Charles W. Martin. Illustrated description of the design and construction features. 1200 w. Eng News—June 12, 1913. No. 42812.

Bridges and Culverts for Country Roads. A. R. Hirst. Read before the Am. Road Cong. An account of standard practice in the state highway work in Wisconsin. 2200 w. Eng News—Oct. 9, 1913. No. 45801.

Highway Bridges and Culverts. W. A. McLean. Gives the general types used in Ontario; the present use of concrete, the materials, inspection, and matters related. Discussion. 10000 w. Pro Am Road Bldrs Assn—1913. No. 46170 N.

Curves

Contributions to the Study of Curved Bridges (Contributo al Calcolo dei Ponti in Curva). Cesare Chiodi. A series of mathematical formulæ for railway bridges around curves. Diagrams. 4000

Consult Classification of the Index. See page 9.

Design

BRIDGES

Floors

w. Monit Tec — May 20, 1913. No. 43092 D.

Design

Railroad Bridge Designs in Europe and America Compared. Edward Godfrey. Mainly a comparison of specifications. Discussion. 17500 w. Jour W Soc of Engrs — March, 1913. No. 41271 D.

The Stability of Elastic Systems (Sur la stabilité des systèmes élastiques). M. S. Timochenko. The application of a new method in the determination of stability in certain bridge members. Diagrams. Serial, 1st part. 28,000 w. Ann d Ponts et Chaussées—May-June, 1913. No. 43562 E. + F.

Drawbridges

Bridges Over Navigable Rivers—Some Practical Considerations. C. E. Smith. Discusses rules and laws affecting the construction and operation of drawbridges and lift bridges. Ills. 264 pp. Bul Am Ry Engng Assn—Oct., 1912. No. 37680 E.

Method of Constructing a Vertical Lift Drawbridge; Economic Comparison of Vertical Lift and Swing Spans. From a paper by C. E. Smith, before the Am. Ry. Engng. Assn. The bridge described crosses the St. Francis River, near Marianna, Ark. Ills. 2200 w. Engng & Con — March 19, 1913. No. 40734.

The Economic Theory of Drawbridge Design. Henry Grattan Tyrrell. Gives principles of design applicable to nearly all forms, and discusses designs and related matters. 4000 w. Engng & Con — April 30, 1913. No. 41822.

See also Highways, under *Bridges*, and Bumpers, under RAILWAY ENGINEERING, *Permanent Way and Buildings*.

Dumbarton

Constructional Problems, Dumbarton Bridge, Central California Railway. E. J. Schneider. Outlines, in a general way, the field methods, and discusses details where exceptional problems were met. Ills. 2000 w. Pro Am Soc of Civ Engrs — Jan., 1913. No. 39389 F.

East Haddam, Conn.

Superstructure of the East Haddam Bridge. Illustrated description of a structure over the Connecticut River, with swing and fixed spans, constant floor and varying truss panels, etc. 2500 w. Eng Rec—Nov. 30, 1912. No. 37968.

Substructures of the East Haddam Bridge. Illustrated description of this bridge across the Connecticut River. Special reinforced concrete girder abutment, and a reinforced concrete pivot pier with three tiers of pockets. 1500 w. Eng Rec—Dec. 7, 1912. No. 38075.

Erection

Erection of Kentucky & Indiana Bridge. Illustrates and describes details of the superstructure of a bridge crossing the Ohio River at Louisville, including two 620-ft. simple cantilever trusses. 2200 w. Ry Age Gaz—Jan. 10, 1913. No. 38975.

Erection of Monongahela River Bridge. Illustrates and describes the erection of the long span on approach, moving into position on barge and trucks. Also editorial. 4000 w. Ry Age Gaz—Jan. 17, 1913. No. 39200.

Erection of Lachine Bridge Across the St. Lawrence River. Illustrated account of replacing medium and long single-track spans by a double track superstructure on the old substructure. 1500 w. Eng Rec—April 5, 1913. No. 41119.

Erecting the New Geneva Bridge. Illustrated description of methods used for a double-track skew span, 475 feet long, erected on shore and rolled, floated and lowered to place. 5500 w. Eng Rec—April 26, 1913. No. 41538.

Erection Costs

Erection Costs for a Double-Track Railway Bridge. M. A. O. Stilson. Describes the structure and gives itemized costs. Ills. 1600 w. Eng News—Feb. 20, 1913. No. 39976.

English Channel

Notable Engineering Plans for Crossing the English Channel by Bridge or Tunnel. H. G. Tyrrell. Reviews the bridge projects and estimates proposed at various times; and the tunnel projects and estimates. 3000 w. Engng & Con — March 19, 1913. No. 40735.

Failure

The Glen Loch Bridge Wreck. Report of a bridge failure that wrecked a train on the Penn. R. R., Nov. 27. Ills. 3500 w. Eng News—Dec. 19, 1912. No. 38337.

The Glen Loch Wreck—More Facts. Charles A. Wentworth. Illustrated article giving a description of the bridge, the damage, and the cause of the failure. 5000 w. Eng News—Dec. 26, 1912. No. 38595.

The Cause of Failure in a Bridge (La causa della caduta di un ponte). C. Fossa Mancini. Study of pier failure in an arch bridge in Italy. Plate. 2200 w. Ann d Soc d Ing e d Arch Ital—April 1, 1913. No. 41531 E.

Floors

Floors for Movable Bridges: A Summary of Practice and Experience. H. G. Tyrrell. 4000 w. Engng & Con—Feb. 19, 1913. No. 39935.

Floors

Placing a Metallic Flooring Over a Wide Span on a Navigable Stream (*Remplacement du tablier métallique à un ouvrage de grande ouverture sur rivière navigable*). M. Bouchard. A difficult piece of work on the St. Nicholas bridge over the Oise. Ills. 2600 w. Rev gen des Chemins de Fer—March, 1913. No. 40585 G.

Forth Bridge

The Forth Bridge; Renewal of Rail-Troughs and Floor-Plates. Editorial. Remarks on the great development of traffic and description of reconstruction work to be undertaken. 1600 w. Engng—Oct. 3, 1913. No. 45862 A.

Foundations

Foundations for Pitt River Bridge. Illustrated description of features of construction of this bridge in British Columbia. 1200 w. Can Engr—June 19, 1913. No. 42991.

Foundation Work on the Pitt River Bridge. Describes foundation work, under difficult conditions for a new bridge on the Canadian Pacific Ry. about 20 miles from Vancouver, B. C. Ills. 1500 w. Eng Rec—June 28, 1913. No. 43303.

See also Piers and Viaducts, under *Bridges*.

Highway

A Three Span, Pony Truss Street Bridge With Concrete Protected Floor Over Railway Tracks. A. W. Carpenter. Describes a bridge in the city of Niagara Falls, N. Y., carrying 11th St. over the tracks of a branch of the N. Y. C. & H. R. RR. Ills. 4000 w. Engng & Con—Nov. 13, 1912. No. 37571.

A Highway Bridge With Provision for a Future Draw Span; Trail, B. C. E. E. Howard. Illustrated description of a riveted truss bridge across the Columbia River. 1500 w. Eng News—Dec. 5, 1912. No. 38064.

The Design of Various Types of Highway Bridges from the Standpoint of Modern Traffic. F. H. Neff. From a paper read before the Am. Assn. for the Adv. of Science. Discusses the effects and requirements of modern traffic. 3500 w. Engng & Con—Jan. 22, 1913. No. 39329.

Highway Bridge Over the Miami River at Elizabethtown, Ohio, That Resisted the Recent Flood. Illustrated description of this pin-connected, simple-truss bridge. 1800 w. Can Engr—April 17, 1913. No. 41340.

The New Highway Bridge at Rothenburg, Luzerne Canton (*Die neue Strassenbrücke bei Rothenburg, Kanton Luzerne*). Details of combination masonry and concrete arched bridge. Ills. 1500

BRIDGES

Maintenance

w. Schweiz Bau—March 1, 1913. No. 40531 D.

Notes on Highway Bridge Construction. F. Tissington. Remarks on the lack of uniformity in specifications, discussing the outline of truss, panel lengths, flooring, and giving tables for designers. 2500 w. Con Rec—Sept. 3, 1913. Serial, 1st part. No. 44934.

New York State Highway Department Bridges. Illustrates and describes types and details of steel girder and truss spans for suburban traffic. 1200 w. Eng Rec—Sept. 27, 1913. No. 45481.

Highway Bridge Specifications. Gives the requirements for fabrication of steel superstructures as outlined by the U. S. Office of Public Roads. 3500 w. Eng Rec—Aug. 30, 1913. No. 44891.

See also Reinforced Concrete, Steel and Viaducts, under *Bridges*.

Hudson River

Proposed Highway Bridge and Highway Tunnels Across the Hudson at New York. Gives the recommendations and designs recommended by the commissioners of the states of New York and New Jersey. 2000 w. Eng News—April 24, 1913. No. 41622.

Proposed Hudson River Bridge and Tunnels to Connect New York and New Jersey. Describes plans for an 8-track, 2880-foot suspension span and two tubes with 17-foot roadways, recommended by the Interstate Commission. Ills. 3500 w. Eng Rec—April 5, 1913. No. 41122.

Italy

Old and New Bridges in Ascoli Piceno (*Vecchi ponti e Ponte nuovi in Ascoli Piceno*). E. Cesari. Illustrations and descriptions of ancient bridges and aqueducts in this province and details of new bridge being erected. Plate. 3100 w. Ann della Soc d Ing ed Arch Ital—April 16, 1913. No. 42500 E.

Kaw River

Reconstruction of Kaw River Bridge. Illustrated description of difficult work at Kansas City, Kan., in building pile foundations on open-sheeted cofferdams. 2000 w. Eng Rec—April 19, 1913. No. 41356.

Loads

Some Experiments on Highway Bridges Under Moving Loads. F. O. Dufour. Information based on experiments carried out at the Univ. of Illinois to obtain more intelligent designs. Ills. Discussion. 5000 w. Jour W Soc of Engrs—June, 1913. No. 43764 D.

Maintenance

Bridge Maintenance. Suggestions for bridge engineers. 1500 w. Ry Age Gaz—June 20, 1913. No. 43101.

Maintenance

Maintenance of Great City Bridges. Report of the organization and equipment for the maintenance, operation, inspection, repair and renewal of the East River bridges, New York. Ills. 4500 w. Eng Rec—Jan. 25, 1913. No. 39368.

Masonry

Some Recent American Masonry Bridges. Edward Pearce Casey. Illustrates and describes types, discussing features of design and construction. 2500 w. Am Archt—Sept. 24, 1913. No. 45425 C.

Material

Recent Observations on the Subject of the Use of High Quality Material in Bridge Construction (Neuere Beiträge zur Frage der Verwendung hochwertiger Materialien im Brückenbau). F. Bohny. Comments on the experiments made for the St. Louis municipal bridge, sway-bracing, rivets, and compression members. Ills. 2800 w. Stahl u Eisen—Sept. 18, 1913. No. 46001 D.

New York

An Opportunity for a Bridge Across the North River at New York City. Gustav Lindenthal. From the *N. Y. Times*. Explains conditions that are forcing the problem of connecting the railroads entering New Jersey with New York City, and the advantages of a bridge across the river. Also editorial. 3800 w. Eng News—Dec. 19, 1912. No. 38334.

Ohio River

The Ohio River Highway Bridge at Sewickley. V. R. Covell. Gives the history, design and erection methods. The structure has six approach spans, two anchor, and two cantilever arms and one suspended span. Ills. General discussion. 11500 w. Pro Engrs Soc of W Penn—Oct., 1912. No. 38280 D.

The Beaver Bridge Over the Ohio River. Frank W. Skinner. Illustrated detailed description of a new cantilever bridge from Monaca to Beaver, 25 miles below Pittsburgh, Ills. 3000 w. Engng—Jan. 10, 1913. Serial. 1st part. No. 39257 A.

Piers

Building Bridge Piers Adjacent to a Masonry Dam. Illustrates and describes work under construction at Cumberland, Md., presenting peculiar pier problems. 1200 w. Eng Rec—Nov. 30, 1912. No. 37965

Tests of Grouting Gravel in River Beds. H. H. Cartwright. Describes interesting experiments made for the purpose of determining the possibility of applying the process to the formation of pier footings.

BRIDGES

Also editorial. Ills. 4000 w. Eng News—May 8, 1913. No. 41946.

Methods of Constructing Piers for the New Double Track Deck Plate Girder Bridge Over Cedar River at Moscow, Ia. C. E. Ziegenbein. Illustrated description of piers for an 11-span double track deck plate girder structure. 1100 w. Engng & Con—Nov. 13, 1912. No. 37570.

Pivot Pier of Chelsea Bridge North. Illustrated description of work near Boston. A hollow concrete shaft and foundation built in a submerged basket crib. 1500 w. Eng Rec—Aug. 2, 1913. No. 44126.

Construction of New Quebec Bridge Piers. H. P. Borden. Illustrates and describes methods used in sinking very large caissons and building concrete and granite piers for St. Lawrence river structure. 2500 w. Ry Age Gaz—Aug. 29, 1913. No. 44805.

See also Quebec, under *Bridges*.

Plate-Girders.

The Red Deer River Bridge—Alberta Central Railway. Hugh A. Lumsden. Illustrated description of this bridge and its erection. 1200 w. Can Engr—Jan. 30, 1913. No. 39619.

Group of Railroad Plate-Girder Bridges at Akron, Ohio. Drawings and brief description. 1000 w. Eng Rec—March 29, 1913. No. 40959.

Plate Girder Bridges in Railway Construction. C. H. Marrs. Considers types in use, their advantages over other designs, their design, erection, &c. Ills. 9500 w. Can Engr—June 26, & July 3, 1913. Serial. 2 parts. No. 43679.

Mississippi River Bridge at St. Paul, C. G. W. R. R. Illustrated description of a single track structure consisting of 7 deck plate girders and one vertical lift span. 2500 w. Ry Engng & Main of Way—Aug., 1913. No. 44358.

Some Points Relative to the Design and Shipment of Plate Girders. Abstract of an article in *Ap. Science*, by C. H. Marrs. Ills. 2000 w. Engng & Con—Oct. 22, 1913. No. 46130.

Pontoons

The New Pontoon Bridge at Constantinople. Illustrated description of a new bridge over the Golden Horn, connecting Galata with Stambul. 800 w. Engr, Lond—Dec. 6, 1912. No. 38250 A.

Projects for a Pontoon Bridge Over the Houghli at Calcutta (Projets de Ponts flottants sur l'Houghli, a Calcutta). Details of plans submitted by Head, Wrightson and Co. Ills. and plate. 2800 w. Génie Civil—Nov. 2, 1912. No. 37520 D.

Modern Engineering in an Ancient

Pontoon

Eastern Capitol. F. C. Coleman. Illustrated description of the new pontoon bridge over the Golden Horn, Constantinople. 1500 w. Sci Am Sup—Jan. 25, 1913. No. 39333.

Pontoon Bridges. Henry Grattan Tyrrell. Considers types suitable for both fixed and moving spans, their advantages and disadvantages, cost, etc., illustrating and describing ancient and modern bridges in various parts of the world. 7000 w. Ap Sci—April, 1913. No. 42358 C.

The New Floating Bridge Over the Golden Horn at Constantinople (Le nouveau pont flottant, sur la Corne d'Or, à Constantinople). Ch. Dantin. Recently completed highway bridge to Galata with movable section. Ills. 2200 w. Genie Civil—April 19, 1913. No. 42192 D.

See Submerged Viaducts, under Bridges.

Portland, Ore.

The New O.-W. R. & N. Bridge at Portland, Oregon. W. P. Hardesty. Illustrated description of a double-deck bridge with vertical lift, over the Willamette River, costing about \$1,700,000. 5500 w. Eng News—Dec. 12, 1912. No. 38181.

The Broadway Bridge Over Willamette River, Portland, Ore., with Ball Bascule Span. W. R. Hardesty. Illustrated description of a bridge consisting of two Pratt-truss and four Baltimore-truss spans 125 to 297 ft. long, and a two-leaf bascule span 278 ft. long. 4500 w. Eng News—Oct. 9, 1913. No. 45798.

Quebec

The Construction of the South Main Pier of the Quebec Bridge. H. P. Borden. Illustrated description of the methods of construction and conditions. 2500 w. Can Engr—Oct. 31, 1912. No. 37264.

The Construction of the South Main Pier of the Quebec Bridge. Describes the methods and the contractor's plant. Ills. 2000 w. Eng News—Nov. 7, 1912. No. 37316.

The South Main Pier of the Quebec Bridge. Plan, illustrations and description of the construction work. 2500 w. Engr, Lond—Dec. 27, 1912. No. 38902 A.

Progress on Quebec Bridge Substructure. Illustrates and describes recent work and methods used in the construction. 3500 w. Eng Rec—Nov. 30, 1912. No. 37963.

Progress in Connection with the Construction of the Quebec Bridge. Illustrates and describes the construction of the new piers. 1500 w. Can Engr—Feb. 13, 1913. No. 39824.

BRIDGES**Reconstruction**

The Reconstruction of the Quebec Bridge. G. Kriwoschein. Illustrates and describes a design proposed by a Russian engineer, giving calculations showing a large saving and advantages. 1500 w. Sci Am Sup—May 10, 1913. No. 41914.

Adopted Design of the Quebec Bridge. Ralph Modjeski. Discussion of elements considered in designing the longest span in the world. Ills. 4500 w. Ry Age Gaz—Sept. 26, 1913. No. 45444.

The Construction of the Masonry for the New Quebec Bridge. A review of the construction of the piers. Ills. 2800 w. Engr, Lond—Sept. 26, 1913. No. 45744 A.

Railway

Replacing Cedar River Bridge. Illustrated account of the replacement of single-track truss bridge, by double-track spans, on the C., R. I. & P. Ry. 2000 w. Eng Rec—Aug. 16, 1913. No. 44429.

Renewing Two Double-Track Swing Spans. Illustrates and describes methods used in replacing bridges on the Jersey Central over Hackensack and Passaic rivers and rebuilding $2\frac{3}{4}$ miles of line. 1800 w. Ry Age Gaz—Oct. 12, 1913. No. 45917.

Bridges of the Connecticut Company. Illustrated descriptions of structures with an account of investigations, including approximate methods of determining loading. 2500 w. Elec Ry Jour—Oct. 4, 1913. No. 45712.

Calculation of Railway Bridges, Having Straight Girders and Independent Trusses (Calcul des Ponts de Chemins de Fer à Poutres Droites et à Travées Indépendantes). M. E. Pentecôte. Considers uniformly distributed loads. Ills. and plates. Serial. 1st part. 8800 w. Rev Gen des Chemins de Fer—Oct., 1912. No. 37494 G.

Reconstruction

Reconstruction of Cumberland River Bridge. Frank R. Judd. Illustrates and describes details of the flood conditions, the strengthening of the old piers and the erection of the new spans for this bridge. 2000 w. Ry Age Gaz—Nov. 1, 1912. No. 37246.

Reconstruction of the Roche-Bernard Bridge (Notice sur la Reconstruction du Pont de la Roche-Bernard). M. M. Bénézit et Tarnier. Description of triple-jointed arch bridge with a span of nearly 200 meters, also history of the former bridge built in 1840, and reasons for reconstruction. Ills. and plates. 14400 w. Ann de Ponts et Chaussées—Sept.-Oct., 1912. No. 37488 E + F.

Method of Enlarging a Single-Track Swing Bridge, Substructure to Carry a

Reconstruction

Double-Track Span. C. E. Smith, in a paper before the Am. Ry. Engng. Assn. Plans and description of work on the Little Red River bridge. 1600 w. Engng & Con—March 26, 1913. No. 40841.

Reconstruction of Kaw River Bridge. C. E. Smith. Describes how old spans were moved transversely and endwise and another span added. Ills. 3000 w. Ry Age Gaz—July 11, 1913. No. 43662.

Reinforced Concrete

Large Reinforced Concrete Bridges in Pittsburgh. N. S. Sprague. Abstract of a paper read before the Nat. Assn. of Cement Users. Illustrates and describes important bridges and problems of design. 2000 w. Eng Rec—Dec. 21, 1912. No. 38327.

Reinforced Concrete Arches in Pittsburgh. Illustrates and describes bridges over streams, railroads, boulevards and streets, of beautiful design. 4000 w. Munic Engng—March, 1913. No. 40897 C.

Larimer Ave. and Atherton Ave. Concrete Arch Bridges, Pittsburgh. Illustrates and describes these and other bridges of Pittsburgh. 3500 w. Eng News—Dec. 19, 1912. No. 38329.

Atherton Avenue Highway Bridge, Pittsburgh. Illustrates and describes the design and construction of three 90-ft. skew-span reinforced concrete arches erected on falsework trusses over railroad tracks. 2000 w. Eng Rec—May 17, 1913. No. 42215.

General Method Adopted for Constructing a 312-Ft. Reinforced Concrete Arch Bridge at Lorimer Ave., Pittsburgh, Pa. Charles H. McAlister. Illustrated detailed description of the erection of the longest span of its kind in America. 3000 w. Engng & Con—Jan. 8, 1913. No. 38939.

Broadway Bridge Across the Oswego River and the New York Barge Canal at Fulton, N. Y. Illustrates and describes an ornamental structure of reinforced concrete built by unusual methods on the site of an existing steel bridge. 2500 w. Eng Rec—Jan. 25, 1913. No. 39365.

Recent Applications of Concrete and Reinforced Concrete in the City of Pittsburgh. N. S. Sprague. Read before the Nat. Assn. of Cement Users. Relates to the application of reinforced concrete to bridge repairs and new construction. Ills. 5000 w. Cement—Dec. 1912. No. 41150 C.

Recent Wide-Spanned Reinforced Concrete Bridges (Neuere weitgespannte Eisenbetonbrücken). Theodor Gesteschi. The first number describes the Larimer Street arch bridge in Pittsburgh. Ills.

BRIDGES

Reinforced Concrete

Serial, 1st part. 1900 w. Beton u Eisen—March 14, 1913. No. 41429 E.

Concrete Highway Bridge at Ansonia, Connecticut. Drawings and description of a reinforced concrete and steel girder bridge under construction. 1500 w. Eng Rec—Feb. 22, 1913. No. 40106.

Method of Constructing a Reinforced Concrete Arch Bridge of Six 70-foot Spans for Electric Railway Service. Illustrated description of methods used for a bridge near Waterloo, Ia., designed to meet steam railway service. 1200 w. Engng & Con—March 5, 1913. No. 40346.

Reinforced Concrete Highway Bridges. George H. Herrold. Illustrates and describes types and their construction. 2200 w. Jour Assn of Engng Soc—Feb., 1913. No. 40089 C.

The Designing and the Methods and Cost of Constructing a Flat Slab Reinforced Concrete Highway Bridge. E. W. Robinson. Sections and description of a bridge subject to considerable heavy traffic. 1500 w. Engng & Con—March 5, 1913. No. 40345.

A Reinforced Concrete Railroad Bridge. W. P. Day. Illustrated description of a structure across the American River, near Auburn, Cal. 1500 w. W Engng—May, 1913. No. 42271 C.

The Yardley Bridge Across the Delaware River, Philadelphia & Reading Ry. Illustrates and describes the design and construction of one of the largest two-track concrete railway bridges in existence. 4500 w. Eng News—May 29, 1913. No. 42560.

A Four-Span Reinforced Concrete Deck Plate Girder Bridge, Typifying Illinois Highway Commission Practice. Illustrates a structure constructed according to present standards. 2000 w. Engng & Con—July 9, 1913. No. 43613.

Colorado Street Bridge Over the Arroyo Seco, Pasadena, Cal. Illustrated description of a reinforced concrete bridge under construction. The arches are of especially light form, and a peculiar system of centering, curved plan and low cost are some of the points of interest. 1800 w. Eng News—July 24, 1913. No. 43878.

Washington Street Bridge in Norwalk, Conn. Illustrated description of a bridge having ten reinforced-concrete spans and one double-leaf bascule, plate-girder span. 1500 w. Eng Rec—July 26, 1913. No. 43935.

Gunpowder and Bush River Bridges. Illustrates and describes double-track reinforced concrete structures on the Pennsylvania R. R. with 295 short spans on pile foundations in deep mud. 2000 w. Eng Rec—Aug. 9, 1913. No. 44236.

Reinforced Concrete

Santa Ana Reinforced Concrete Arch Bridge. W. M. Thomas. Illustrated description of this three-hinged arch bridge in California. 1000 w. W Engng—Oct., 1913. No. 46380 C.

Ferro-Concrete Bridge Over the River Lagan. Illustrated description of the new Stanmillis Bridge in Belfast, Ireland. 1200 w. Engr, Lond—May 9, 1913. No. 42293 A.

Reinforced Concrete Bridges in the Bavarian Forests (Eisenbetonbrücken im Bayerischen Wald). C. F. Müller. First part gives details in the design of a foot-bridge over the Regen. Ills. Serial. 1st part. 1800 w. Beton u Eisen—Oct. 21, 1912. No. 37432 E.

The Nassentelle Bridge at Lauscha (Brücke Nassentelle bei Lauscha, S.-Mein.). M. Rudiger. Details in construction of composite masonry and reinforced concrete. Ills. 3200 w. Beton u Eisen—Jan. 20, 1913. No. 40031 E.

Highway Bridge Over the Möhne Valley at Korbach (Strassenbrücke über das Möhnetal bei Körbecke). Herr Lewe. Details of bridge with masonry piers and reinforced concrete arches. Ills. 2600 w. Beton u Eisen—Feb. 13, 1913. No. 40525 E.

The 200-Meter Reinforced Concrete Viaduct Across the Lister Valley at Stein (200 m langer Eisenbetonviadukt über die Listertalsperre bei Stein). Viktor Mautner. The calculations and design of the reinforced concrete bents and flooring. Ills. 1600 w. Beton u Eisen—Feb 26, 1913. No. 40527 E.

The Ems-Weser Canal and Its Reinforced Concrete Structures (Der Ems-Weser-Kanal und seine Eisenbetonbauten). Herr Hart. Describes chiefly the reinforced concrete bridges along the canal. Ills. Serial. 1st part. 2800 w. Beton u Eisen—April 1, 1913. No. 41431 E.

Bridge over the Lahn near Graveneck (Brücke über die Lahn bei Gräveneck). Herr Schluckebier. Description of a 300-foot three-span reinforced-concrete arch bridge. Ills. 2600 w. Beton u Eisen—June 12, 1913. No. 43521 E.

The Construction of the Walche Bridge in Zürich (Zum Bau der Walchebrücke in Zürich). Fritz Locher. Details of caisson and pier foundation work, spacing of reinforcement, forms, etc. Ills. 1800 w. Schweiz Bau—July 5, 1914. No. 44640 D.

The Aar Bridge at Aarburg (Die Aare-Brücke bei Aarburg). O. Zehnder. Description of long single-span reinforced concrete bridge replacing a wire suspen-

BRIDGES

sion bridge. Ills. 2000 w. Schweiz Bau—July 26, 1913. No. 44641 D.

The Halen Reinforced-Concrete Bridge, Berne, Switzerland. Illustrated description of its design and construction. 4500 w. Eng News—Sept. 18, 1913. No. 45218.

Two Reinforced Concrete Railway Bridges (Zwei Eisenbahnbrücken aus Eisenbeton). Robert Berman. Plans and construction details of two new bridges in Bremen. Ills. Serial, 1st part. 700 w. Beton u Eisen—Oct. 2, 1913. No. 46031 E.

Reinforced Concrete Bridge at Rome. Illustrated description of the armored-concrete bridge over the Tiber, notable as one of the largest arches in the world. 3000 w. Engr, Lond—May 16, 1913. No. 42545 A.

See also Arches, and East Haddam, Conn., under Bridges.

Reinforcing

Supporting a Large Derrick from a Steel Bridge Tower. Illustrated description of methods used in reinforcement of the Williamsburg bridge, across the East River, at New York. 1500 w. Eng Rec—Dec. 21, 1912. No. 38324.

Removal

Moving the Union Pacific Kaw River Bridge. Illustrated detailed description of work at Kansas City, including the removal of two 180-ft. spans of the double-track, pin-connected bridge, each weighing 550 tons. 1200 w. Eng Rec—May 31, 1913. No. 42643.

Renewals

An Interesting Method of Bridge Renewal. Illustrated description of the replacing of a single track through truss bridge over the Cedar River, near Moscow, Iowa, with a double-track deck plate girder structure, without interruption of traffic. 1000 w. Ry Age Gaz—April 18, 1913. No. 41350.

Renewing Two Swing Spans Under Traffic. Illustrates and describes the use of open timber caissons in building concrete piers for bridges on the Grand Trunk Ry. at Lacolle, Que., and Portland, Me. 1500 w. Ry Age Gaz—June 20, 1913. No. 43103.

Replacement

Replacing the Yardley Bridge. Illustrated description of interesting work at Yardley, Pa., on the P. & R. Ry. 2000 w. Eng Rec—May 3, 1913. No. 41846.

Method of Replacing a Five-Span Through Truss Bridge with Deck Plate Girder Spans, Chicago & Alton Railway. Illustrated description of work at Wilmington, Ill. 1600 w. Engng & Con—May 28, 1913. No. 42518.

Replacement

Replacement

New Ohio River Bridge at Kenova, W. Va. Illustrated account of the replacing of a five span, double track, through truss structure on some piers without interrupting traffic. 5000 w. Ry Age Gaz—Sept. 5, 1913. No. 44980.

Replacing the Cuyahoga River Draw Bridge. Illustrates and describes the erection of a double track bascule span in balanced vertical position over traffic by means of sliding travelers. 1600 w. Eng Rec—Jan. 4, 1913. No. 38804.

Roadways

A Comparison of the Different Types of Wearing Surfaces Used for the Roadways of Bridges. Henry B. Browne. From a report to the Int. Road Congress, London. Deals with qualities and cost of different types. 4000 w. Engng & Con—July 9, 1913. No. 43611.

Sawing

Sawing a Bridge with a Wire. Jacques Boyer. An illustrated account of how the old Pont Neuf was sawn apart. 800 w. Sci Am—Sept. 20, 1913. No. 45232.

Scherzer

Twin Scherzer Bridges at Dublin. Explains conditions when the bridges were erected, and illustrates and describes the new bridges and their operation. 1800 w. Engr, Lond—Sept. 19, 1913. No. 45572 A.

Steel

The Use of High Grade Steel for Bridge Material (Die Verwendung hochwertigen Stahles als Brückenmaterial). Rudolf Schanzer. Arguments on the use of nickel-steel, and comparison of American and German nickel-steel. Ills. 5500 w. Zeit des Oest Ing u Arch Ver—Feb. 28, 1913. No. 40550 D.

Some Necessary Precautions in the Design and Supervision of Construction of Low-Truss Steel Highway Bridges. G. M. Braune. Gives conclusion drawn from numerous highway bridge failures; precautions when using heavy concrete floors and other details. 1500 w. Eng News—Aug. 28, 1913. No. 44881.

See also Arches, Railway and Viaducts, under Bridges.

St. Lawrence

Erecting the St. Lawrence River Bridge. Explains conditions which made it advisable to use a very small amount of falsework in the erection of the superstructure. Ills. 2000 w. Ry Age Gaz—May 9, 1913. No. 41948.

The Canadian Pacific Railway Bridge Over the St. Lawrence River at Lachine. W. P. Murray. Brief illustrated description of some of the interesting problems solved in the erection of this bridge over the St. Lawrence River. 1000 w. Can Engr—Aug. 7, 1913. No. 44279.

BRIDGES**St. Louis**

Municipal Bridge Approach, St. Louis. S. W. Bowen. Describes the viaduct approach for railway and steel connections at the St. Louis end of the bridge, with the methods of construction. Ills. 5500 w. Eng News—Jan. 16, 1913. No. 39196.

Submerged Viaducts

Floating Tunnels and Submerged Viaducts. Henry Grattan Tyrrell. Discusses the merits and possibilities of such structures. 3500 w. Marine Rev—June, 1913. No. 42807 C.

Substructures

Method of Constructing a Bridge Superstructure on Soft Bottom. From a paper by C. E. Smith, before the Am. Ry. Engng. Assn. Describes pier reconstruction on a bottom so soft that the driving of adjacent piling caused movement of the old pier. 2700 w. Engng & Con—March 26, 1913. No. 40842.

Difficulties in Placing the Substructure for a Swing Bridge. Describes work on a bridge across the Passaic River at Newark, N. J., in which a cofferdam of wood and sheet steel piling was used for deep river-bed excavations. Ills. 2000 w. Eng Rec—March 8, 1913. No. 40370.

Some Constructive Features of the Substructure of the Cumberland River Bridge, L. & N. Ry. Howard M. Jones. Explains conditions and describes construction methods. Ills. 2500 w. Eng News—May 22, 1913. No. 42349.

Substructure for East River Bridge Division, New York Connecting Railway. Describes the building of high concrete piers and retaining walls and deep caisson foundations for three and one-half miles of four-track viaducts and bridges. Ills. 3000 w. Eng Rec—Sept. 20, 1913. No. 45270.

Suspension

Superstructure and Erection of the Messina Center Bridge. Illustrated description of a suspension bridge with 400-ft. central span erected without steam power. 2500 w. Eng Rec—Nov. 2, 1912. No. 37223.

A Famous English Chain Suspension Bridge. Illustrated description of the Clifton suspension bridge over the River Avon, at Bristol, Eng. 1000 w. Eng News—Jan. 30, 1913. No. 39589.

Notes on the Calculation of Suspension Bridges Stiffened by Cable Supports and Rigid Girders (Note sur le calcul des ponts suspendus rigides à haubans et poutre de rigidité). H. Lossier and Maurice Pernollet. Mathematical study of formulae. Ills. Serial, 1st part. 4000 w. Genie Civil—Feb. 1, 1913. No. 40071 D.

Suspension

Suspension

Stiffening Members in Suspended Bridges (Étude des poutres raidissantes dans les ponts suspendus). E. Lebert. A study of the Gislard system of suspension. Ills. 16000 w. Ann d Ponts et Chaussées — Jan., 1913. No. 41507 E + F.

Suspension Bridges and Cantilevers. D. B. Steinman. Read before the Cong. of Engng. Soc. at Spokane, Wash. A discussion of the relative economy of these two forms of construction. 3500 w. Eng Rec—May 17, 1913. Serial. First part. No. 42218.

A Comparative Study of Limiting Span, Maximum Span and Economic Span for Suspension Bridges and Cantilever Bridges. D. B. Steinman. Discussion at the Congress of Engineering and Scientific Societies at Spokane, Wash. Ills. 5000 w. Engng & Con—May 7, 1913. No. 41908.

The Repairs to the Menai Suspension Bridge. Edward George Rivers and Edward Harold Morris. Describes the bridge and its condition, and the method of carrying out the repairs. Plates. 19 pp. Inst of Civ Engrs—No. 3984. No. 42373 N.

Fixed Gislard Suspension Bridge over the Luzège, Corrèze (Pont suspendu fixe, système Gislard, sur la Luzège, Corrèze) G. L. Le Coeq. Illustrated description of this new railway bridge of 140 meters span, showing method of construction. Plate. Serial. 1st part. 4000 w. Genie Civil—May 31, 1913. No. 43085 D.

Swing Span

Southern Pacific Bridge at Sacramento. Illustrates and describes a double-track, double-deck structure, with highway on upper level—believed to be the heaviest swing span ever built. 2500 w. Ry Age Gaz — April 11, 1913. No. 41177.

Vancouver

New Bridges at Vancouver, British Columbia. This first article of a series illustrates and describes the Westminster Avenue bridge. Plate. 1000 w. Engr, Lond—Jan. 10, 1913. Serial. 1st part. No. 39272 A.

Viaducts

Construction Features of the Kings-highway Viaduct, St. Louis, Missouri. Illustrates and describes reinforced concrete arches with hollow piers and retaining wall approaches. 2200 w. Eng Rec—Nov. 25, 1912. No. 37756.

Method of Designing Arches, Kings-highway Viaduct, St. Louis. Drawings and explanation of the method of design as given in a paper by A. C. Janni, read before the Engineers' Club of St. Louis.

BRIDGES

1000 w. Eng Rec—Feb. 1, 1913. No. 39648.

Construction of the Concrete Viaduct Between Dallas and Oak Cliff, Texas. E. N. Noyes. Illustrates and describes methods used in building a girder and arch structure 6562 feet long. 3500 w. Eng Rec—Nov. 9, 1912. No. 37355.

Methods and Cost of Constructing the Stony Brook Glen Viaduct, Pittsburg, Shawmut & Northern Railway. H. S. Wilgus. Illustrated description of this structure, between Hornell, N. Y., and Wayland, N. Y. 1200 w. Engng & Con—Nov. 20, 1912. No. 37705.

Milwaukee's Concrete Viaduct. Duane Mowry. Illustrated description of this ten-arch viaduct and its construction. 1800 w. Munic Jour—Oct. 31, 1912. No. 37177.

Penn Street Viaduct at Reading, Pennsylvania. Illustrated account of the replacing of a steel viaduct by a concrete structure on the same center line without serious interruption to traffic. 2200 w. Eng Rec—Nov. 30, 1912. No. 37966.

Construction of the Fifth Street Viaduct, Fitchburg, Massachusetts. Illustrated description of the erection of a concrete highway structure 650 ft. long, with spans supported by the reinforcement steel without falsework during construction. 2000 w. Eng Rec—Jan. 4, 1913. No. 38799.

The Fifth Street Viaduct, Fitchburg, Mass. Illustrated description of a reinforced concrete structure and its erection. 2500 w. Eng News—March 6, 1913. No. 40351.

The Hapuawhenua Viaduct, New Zealand. Frederick William Furkert. Describes a railway viaduct built on a curve of 660 ft. radius. A steel superstructure on concrete piers and base blocks. 1800 w. Inst of Civ Engrs—No. 3891. No. 39296 N.

Repairing Cracks in the Viaduct of a Hundred Arches by Cement Jets (Consolidation par injection de ciment du Viaduc des cent Arches). M. Adam. The nature of the work, type of pump used, and results. Ills. 1750 w. Rev Gen des Chemins de Fer.—Feb., 1913. No. 40064 G.

Method and Unit Costs of Constructing Piers and Abutments for a High Steel Viaduct for the Fort Dodge, Des Moines & Southern (Electric) Ry. C. J. Steigleder. Illustrated description of the work. 2500 w. Engng & Con—March 19, 1913. No. 40733.

Gilbert Avenue Viaduct in Cincinnati. Illustrated description of a reinforced concrete structure of steel and girder de-

Viaducts

Viaducts

sign, showing architectural effects obtained by use of false arches. 2500 w. Eng Rec—March 1, 1913. No. 40266.

The Superior Avenue Viaduct, Cleveland. B. F. Morse. Interesting information relating to this viaduct. 3000 w. Jour Cleveland Engng Soc—March, 1913. No. 40867 C.

A Reinforced Concrete Viaduct for Heavy service. B. H. Davis. Illustrated description of a large reinforced concrete viaduct in Allentown, Pa., and construction details. 3500 w. Concrete-Cement Age—April, 1913. No. 41252.

The South Eighth Street Viaduct, Allentown, Penn. Illustrated description of a large reinforced-concrete viaduct crossing the valley of the Little Lehigh River, and details of its construction. 2500 w. Eng News—April 17, 1913. No. 41332.

Replacing a High Timber Trestle with a Steel Viaduct. Illustrates and describes work on the Fort Dodge, Des Moines & Southern Ry. 2500 w. Eng News—April 24, 1913. No. 41620.

Two Big Concrete Viaducts. Illustrated account of work on the Pennsylvania R. R. bridging the Gunpowder and the Bush Rivers in Maryland, with double-tracked reinforced-concrete viaducts. 1500 w. Mfrs' Rec—April 24, 1913. No. 41608.

The 240 Meter Factory Railway Viaduct of Reinforced Concrete in Pöchlarn on the Danube (Der 240m lange Schleppbahnviadukt aus Eisenbeton in Pöchlarn an der Donau). Leo Kauf. Plan and construction details of curved viaduct, and precautions against expansion. Ills. 2500 w. Zeit des Oest Ing u Arch Ver—March 14, 1913. No. 41473 D.

Foundations for the Tunkhannock Viaduct. Illustrates and describes the design and construction of the substructure of this great concrete bridge of the Lackawanna R. R. 5000 w. Eng Rec—May 3, 1913. No. 41843.

CONSTRUCTION

Buildings

Weldon Viaduct Over the Roanoke River. Illustrated description of a steel structure in North Carolina built by the Atlantic Coast Line. 1000 w. Ry Age Gaz—May 2, 1913. No. 41804.

The Bietsch Valley Viaduct of the Lötschberg Railway (Der Bietschtal-Viadukt der Lötschbergbahn). Adolf Herzog. General description of a light steel truss spanning a deep canyon on a curve, with unusual arrangement of bents and arch supports. Ills. Serial. 1st part. 1100 w. Schweiz Bau—April 19, 1913. No. 42132 D.

The Design and Erection of the Boucanne Viaduct of the National Transcontinental Railway. P. L. Pratley. Drawings and description of this viaduct in Quebec, Canada. 4000 w. Engng & Con—June 18, 1913. No. 42941.

The Boucanne River Viaduct. P. L. Pratley. Illustrates and describes features of design and erection of this railway viaduct in the province of Quebec. 4000 w. Can Engr—Aug. 21, 1913. No. 44570.

The Georgia-Harris Viaduct, Vancouver, B. C. Describes a very long viaduct of somewhat peculiar design under construction on the line of Georgia and Harris Sts. Ills. 1400 w. Eng News—Aug. 21, 1913. No. 44573.

See also Arches, and Submerged Viaducts, under *Bridges*.

Widening

The Widening of Blackfriars Bridge. David Anderson and Harry Cunningham. Illustrated description of methods employed in the work, plant, cost, etc. Plates. 24 pp. Inst of Civ Engrs—No. 3980. No. 42372 N.

Wooden Bridges

Report of Committee VII—On Wooden Bridges and Trestles. Gives detailed report with conclusions and recommendations. Ills. 6500 w. Bul Am Ry Engng Assn—Jan., 1913. No. 40222 F.

CONSTRUCTION

Acoustics

Acoustic Design in the Hill Memorial Auditorium, University of Michigan. Hugh Tallant. Gives an outline of the principles and methods by which the results were obtained. Ills. 3000 w. Br Build—Aug., 1913. No. 44599 D.

Air Pressures

Labor Regulation in Compressed Air (La réglementation du travail dans l'air comprimé). J.-P. Langlois. A study of the precautions to be taken for the safeguarding of workmen. Compression

period, period of labor, and decompression period. 5400 w. Tech Mod—April 1, 1913. No. 41521 D.

Arch Design

Points in the Design of Arches in Ferro-Concrete. R. N. Stroyer. Deals mainly with the fixed-end arch. Ills. 2500 w. Engng—April 25, 1913. No. 41929 A.

Buildings

Construction of the Bigelow Building. Describes work in Boston, where a new store was erected on the site of the old

Consult Classification of the Index. See page 9.

Buildings

CONSTRUCTION

Buildings

one without stopping business. 2000 w. Eng Rec—Dec. 14, 1912. No. 38199.

The Tallest Building in the World. Frank W. Skinner. General illustrated description of the Woolworth Building, its steel work, pneumatic caisson construction, cellar excavation, floor construction, etc. 5000 w. Cornell Civ Engr—Jan., 1913. No. 39392 C.

The Tallest Office Building in the World. Illustrated description of the erection of the Woolworth Building, New York. 2500 w. Sci Am—March 8, 1913. No. 40359.

Engineering Design of the Woolworth Building. Cass Gilbert, Architect. With some general remarks on engineering problems as affected by the New York building code. By Grunwald Aus. Plates. 3500 w. Am Archt—March 26, 1913. No. 40845 C.

The Guaranty Trust Company's New Building, New York City. Eugene W. Stern. Illustrated description of interesting problems in the foundation and steel construction. 2500 w. Eng News—Aug. 7, 1913. No. 44251.

Dome of the Wisconsin Capitol. Describes in some detail the dome of the new capitol, the structural design of the steel framework presenting unusual problems. Ills. 4000 w. Eng News—Aug. 28, 1913. No. 44880.

The Skyscraper of the Future. David H. Ray. Discusses recent progress in building construction. Ills. 2800 w. Sci Am Sup—March 8, 1913. No. 40399.

Machinery Hall, Panama-Pacific Exposition. Discusses the loads and strains and other matters in connection with one of the largest timber structures ever erected. It has a floor area of 8 acres and must be completed in 240 days. 2500 w. Eng Rec—Aug. 30, 1913. No. 44894.

A Half Mile of Concrete Barracks. R. McC. Beanfield. Describes methods and materials used in building reinforced-concrete barracks in Manila Bay, Philippine Is. Ills. 2000 w. Concrete-Cement Age—Oct., 1913. No. 45823.

Construction of the New Museum, "Les Galeries Lafayette," in Paris (La construction des nouveaux batiments des magasins "Les Galeries Lafayette," à Paris). Robert Altermann. Precautions taken against extraneous water percolation in the underground structures, and details of reinforced concrete stairway. Ills. and plate. 2400 w. Génie Civil—Oct. 19, 1912. No. 37517 D.

New Building for the Sulfite-Zellstoff Co. at Malsch (Der Neubau der Sulfite-Zellstoff-Fabrik zu Malsch a. O.). Wil-

helm Iwand. Detailed description of new reinforced concrete paper mill. Ills. 2200 w. Beton u Eisen—Nov. 27, 1912. No. 38427 E.

The New Building of the Institution of Civil Engineers. Illustrations and brief description of the new building in London. 500 w. Engng—Aug. 15, 1913. No. 44724 A.

The Reinforced-Concrete Construction of the Church of St. Mary at Offenbach am Main (Die Eisenbetonkonstruktionen an der St. Marienkirche in Offenbach am Main). Jean Wörlein. General outline of the type of structure under construction. Ills. 2000 w. Beton u Eisen—Dec. 14, 1912. No. 39017 E.

The New City Theater at Duisburg (Das neue Stadttheater in Duisburg). Viktor Mautner. Plans, illustrations and details of this reinforced concrete theater. Plates. Serial. 1st part. 3200 w. Beton u Eisen—Dec. 14, 1912. No. 39015 E.

The Scientific Erection of the Leonhard Tietz Store in Brussels (Die technischen Einrichtungen des Warenhauses Leonhard Tietz in Brüssel). X. Werner. Description of heating and lighting system of a large store. Ills. 3000 w. Zeit des Ver deutscher Ing—Feb. 22, 1913. No. 40543 D.

The A. M. Luther Wood-Working Shop in Reval (Die Tischlereihalle A. M. Luther in Reval). O. Lüscher. Details of mammoth reinforced concrete factory building. Ills. 3900 w. Beton u Eisen—March 14, 1913. No. 41428 E.

The Aesthetics of Industrial Buildings. Peter Behrens. Brief discussion of the design. Ills. 1600 w. Sci Am Sup—Aug. 23, 1913. No. 44504.

Recent Developments Affecting School Building. Percy Morris. Reviews briefly the history of school planning in England since the end of the 18th century, and discusses playgrounds and sites, ventilation and heating, planning and the cost of school buildings. Ills. 10500 w. Jour Roy Inst of Brit Archts—Aug. 30, 1913. Serial. 1st part. No. 45872 N.

Some Effects from the Atmosphere Upon Buildings (Ueber einige Einwirkungen der Atmosphäre auf Bauten). Vincenz Pollack. Chiefly discussing the effects of frost upon foundations and masonry work. Ills. 4000 w. Zeit des Oest Ing u Arch Ver—July 18, 1913. No. 46045 D.

See also Concrete, Factories, Test Buildings, Skyscrapers, Foundations and Reinforced Concrete, under Construction.

Consult Classification of the Index. See page 9.

Building Laws

CONSTRUCTION

Concrete

Building Laws

Municipal Building Laws in the United States. R. Fleming. An article based on a review of the codes of 35 cities, confined to features relating to the design of steel frames of tall buildings of fire-proof construction. 5000 w. Eng News—July 3, 1913. No. 43434.

The Unwritten Law. Manton E. Hibbs. Urges the taking of structural details out of the law, incorporating them in regulations subject to change with the advancement in the art of building. Discusses building laws in large cities. Ills. 6000 w. Pro Engrs' Club of Phila—July, 1913. No. 44335 D.

Bunkers

An Economical Plant for Sand and Gravel. Robert M. Hale. Illustrates and describes the application of modern methods to the solution of bunker problems in Vancouver, B. C. 4000 w. Cement & Eng News—Oct, 1913. No. 45822.

Caissons

Pneumatic Caissons for Tall Buildings. O. W. Ross. Reviews the history of pneumatic processes, the general principles of caissons, underpinning, caisson construction and operation, etc. Ills. 5000 w. Ap Sci—Jan., 1913. Serial, 1st part. No. 39948 C.

Methods and Costs of Constructing the Caisson Foundations for a Steel Skeleton Building in Chicago. Detailed description. Ills. 1600 w. Engng & Con—Oct. 22, 1913. No. 46134.

Caisson for the New Gladstone Dock at Liverpool. Illustrated description of the caisson and hauling machinery associated with it. 1000 w. Engng—Oct. 17, 1913. No. 46245 A.

Camp Sanitation

The Sanitation of Construction Camps. Harold Farnsworth Gray, Jr. States some of the principles of sanitation applicable to camp conditions. Ills. 4000 w. Pro Am Soc of Civ Engrs—Nov., 1912. No. 38289 F.

Cement Gun

Notes on the Operation of the Cement Gun. Otto J. Swenson. Information from personal experience, and the study of a series of tests made by a reliable engineering company. Ills. 2500 w. Eng News—Dec. 12, 1912. No. 38176.

The Cement Gun. William A. Jordan. Illustrated description of this method of handling and placing cement under mortar. 3000 w. Jour Worcester Poly Inst—March, 1913. No. 40863 C.

Chimneys

See Stacks, under MECHANICAL ENGINEERING, Steam Engineering.

Chutes

See Irrigation, under Water Supply.

Cofferdams

Method of Constructing Cofferdam on Shifting Bottom; Ohio River Dam No. 48. An illustrated account of the methods followed, abstracted from a paper by J. C. Oakes, in "*Prof. Mem.*" 1500 w. Engng & Con—March 19, 1913. No. 40729.

Columns

Columns in the New Grand Central Terminal, New York City. Illustrated description of special members in towers supporting the twenty-three story office building over the main concourse. 1200 w. Eng Rec—Feb. 1, 1913. No. 39646.

Comparison of Column Formulae. E. L. Lasier. A comparative study of the collected formulae in use. 1200 w. Eng Rec—July 12, 1913. No. 43657.

The Deflection Method of Calculating the Strength of Columns and Stanchions. A. J. Murray. Explains a fundamental misconception in the Moncrief formula, which has been accepted as the basis of the U. S. Navy instructions for determining the scantling of ship columns. 1800 w. Int Marine Engng—July, 1913. Serial, 1st part. No. 43420 C.

Columns. O. H. Basquin. Discusses principally how it may happen that a column which is built for an axial load may actually or virtually receive an eccentric load. General discussion. Ills. 96 pp. Jour W Soc of Engrs—June, 1913. No. 43763 D.

Reinforced Cast Iron, Dr. v. Emperger's System (Umschnürtes Gusseisen, System Dr. v. Emperger). H. Nitzsche. Cast iron columns given extra strength by a coating of concrete, this coating wrapped with steel wire, and a surface coat of cement. Tables of bearing loads. Ills. 3500 w. Giess Zeit—Sept. 1, 1913. No. 46019 D.

See also Reinforced Concrete, under Materials of Construction.

Compressed Air

The New York Law Governing Work under Compressed Air. Gives the amended law governing the conditions under which labor may be employed under compressed-air pressure. 1700 w. Eng News—Aug. 14, 1913. No. 44374.

See also Tunnel Linings, under Construction.

Concrete

A Concrete Stadium for a Public School Athletic Field. Harold L. Alt. Illustrated description of work on the large athletic field in Brooklyn, N. Y. 3500 w. Concrete-Cement Age—Nov., 1912. No. 37585.

Concrete

CONSTRUCTION

Concrete Forms

Ornamental Use of Concrete in Playground Structures. Illustrates and describes effects obtained in Hoboken park improvement. 1500 w. Concrete-Cement Age—Dec., 1912. No. 38150.

Concrete Practice, No. 5, C., C., C. & St. L. Ry. Co. Illustrates and describes structures adopted as standard and used by the Big Four Ry. 3500 w. Ry Engrg & Main of Way—Dec., 1912. No. 38339.

Patents Relating to Concrete Construction. From a summary by Walter M. Denman, presented to the Nat. Assn. of Cement Users. Deals with features of concrete patents, bridges, buildings, dams, retaining walls and sewers. 2500 w. Eng Rec—Jan. 18, 1913. No. 39189.

Concrete in Railroad Work. Frederick Auryansen. Abstract of a paper before the Nat. Assn. of Cement Users. Illustrates and describes work on the Long Island R. R. 2500 w. Concrete-Cement Age—Jan., 1913. No. 39219.

Concrete Grain Elevator Construction. R. P. Durham. Read before the Nat. Assn. of Cement Users. Reviews the progress, especially the building of bin walls with moving forms. 3500 w. Concrete-Cement Age—Jan., 1913. No. 39220.

Concreting the Floors and Columns in the Butler Brothers Building, Chicago. Describes a special plant for mixing and handling 500,000 cubic yards of concrete in a 23-story building. Ills. 1500 w. Eng Rec—Jan. 11, 1913. No. 38959.

Wrecking a Four-Story Concrete Building in Chicago. Illustrated description of methods used. Oxy-acetylene torches now used to cut the concrete as well as the metal parts. 800 w. Eng Rec.—Feb. 15, 1913. No. 39864.

The Relation of Inspectors and Contractors with Reference to Concrete Construction. Jerome Cochran. Discusses the characteristics and work of inspectors, especially in regard to concrete construction, to determine the most harmonious relations between them and the contractor. 7500 w. Cornell Civ Engr—March, 1913. No. 40876 C.

Concrete Practice No. 6, Kansas City Southern Ry. Co. A. M. Wolf. Describes and illustrates structures of concrete and reinforced concrete that have been adopted as standard. 3000 w. Ry Engrg & Main of Way—March, 1913. No. 40791.

The Fundamentals of Concrete Design. E. Brown. Considers the essentials of good design and the requirements of reliability. 2000 w. Con Rec—May 14, 1913. No. 42087.

A Method of Proportioning Concrete. William B. Hunter. Outlines methods in

use and gives details of the method favored by the writer. 2000 w. Eng News—May 8, 1913. No. 41944.

The Protection of Concrete Structures from Alkali and Other Destructive Agents. W. D'Rohan. Information concerning the resisting powers of various cements and the protective measures. 2500 w. Engng & Con—May 21, 1913. No. 42308.

Eight-Story Concrete Building without Interior Columns. H. D. Loring. A building in Cincinnati, O., is described. Ills. 1500 w. Eng Rec—May 31, 1913. No. 42647.

Experience with Concrete in Fires. G. E. Fisher. Reviews lessons from the Baltimore and San Francisco fires. Discussion. 2500 w. Jour Am. Soc of Mech Engrs—June, 1913. No. 42960 D.

Manure as a Protection for Concrete. Newell G. Alford. Gives results of a trial in utilizing the heat-producing qualities of fresh horse manure in setting of concrete during severe winter weather. Ills. 1600 w. Coal Age—June 21, 1913. No. 42995.

Poured Concrete Houses in France. Illustrated description of a system in which the forms for the whole building are set up and casting done in one operation. 1700 w. Concrete-Cement Age—May, 1913. No. 42014.

The New Barracks at Tolmein (Die neuen Kasernen in Tolmein). Hans Wyss. Details in L-block construction, and methods of making blocks. Ills. 2500 w. Beton u Eisen—Oct. 21, 1912. No. 37430 E.

See also Foundations, under *Construction*; Concrete, under *Materials of Construction*; Concrete, under *Roads and Pavements*; Dikes, and Wharves, under *Waterways and Harbors*.

Concrete Buildings

Constructing a Ten-Story Concrete Building. Illustrated description of the construction of a large factory in Long Island City, N. Y., including the placing of 35,000 yards of concrete in floors and columns, bending reinforcement rods by power, and handling beam and girder forms. 2500 w. Eng Rec—Sept. 20, 1913. No. 45268.

See also Factories, under *Construction*.

Concrete Forms

Steel Forms for Concrete Construction. William Mayo Venable. First of a series of articles, deals with application of steel forms to conduits, culverts and drains. Ills. 3000 w. Concrete-Cement Age—Jan., 1913. No. 39217.

Steel Forms for Concrete Construction. From an article by William Mayo Ven-

Concrete Mixers

able in *The Cement World*. Describes the application of steel in the construction of forms for engineering work, especially for sewers, drains, conduits, tunnels, etc. 2500 w. Can Engr—March 20, 1913. No. 40787.

Concrete-Mixers

Chain-Belt-Driven Concrete-Mixer. Illustrated description of a mixer of the portable type, built in England. 1000 w. Engng—March 21, 1913. No. 41017 A.

Mixing Plants for Bituminous Concrete. A. F. Gruenthal. Descriptions of permanent, portable and semi-portable plants used for work on roads in Queens Borough, New York. 4000 w. Munic Jour—July 10, 1913. No. 43499.

Concrete Plant

A Concrete Mixing and Chuting Plant With a Folding Tower and Mounted on a Flat Car for Retaining Wall Construction. Illustrates and describes a plant of unusual interest being operated on track elevation work in Chicago. 1500 w. Engng & Con—June 11, 1913. No. 42795.

Concrete Roofs

Methods and Costs of Insulating Concrete Roofs Against Condensation. Albert M. Wolf. Deals with practical and economical methods which have been used to insulate concrete roofs, and the particular kind of insulation applicable to each type of building. Ills. 8000 w. Engng & Con—Aug. 20, 1913. No. 44497.

Construction Camps

Construction Camp at Arrowrock Dam. Alfred B. Mayhew. Illustrated account of how necessities and amusements are provided for 1400 workers located 20 miles from Boise, the nearest city. 4000 w. Eng Rec—Aug. 2, 1913. No. 44123.

Construction Plant

Construction Plant for the Third Lock at Sault Ste. Marie, Mich. Illustrated description of the material plant, mixer plant, haulage system, etc. 1500 w. Eng Rec—Dec. 21, 1912. No. 38322.

Storage System for Construction Plant. Describes a storage plant at Greenpoint, Brooklyn, N. Y., for the inspection and maintenance of wood and steel derricks, hoisting engines, ropes, slings and connections for the erection of structural steel work. 3000 w. Eng Rec—April 19, 1913. No. 41355.

Construction Progress

A Practical Method for Following Up Construction Work. Valden W. Welch. Outlines an effective plan applicable to industrial construction generally. First of two articles. 1500 w. Engineering Magazine—June, 1913. No. 43096 B.

CONSTRUCTION

Contractors' Plants

Contractor's Plant and Construction Methods Employed in Building the New Water Supply and Storage Works at La Crosse, Wis. Illustrates and describes some of the construction methods in building wells, well houses or low-lift pumping stations, etc. 3500 w. Engng & Con—Aug. 13, 1913. No. 44344.

Contracts

The Prevention of Fraud in Guarding Public Contracts. Jerome Cochran. States essentials that must be observed if instructions to bidders are to provide for fair competition, applying the principles, and discussing details related to the subject. 9000 w. Cornell Civ Engr—Nov., 1912. No. 37539 C.

Deduction of Liquidated Damages for Delay. William B. King. Report of two important decisions by the U. S. Court of Claims. 2500 w. Eng Rec—Dec. 14, 1912. No. 38196.

See also Arbitration, under INDUSTRIAL ECONOMY.

Contract Work

See Motor Trucks, under MECHANICAL ENGINEERING, *Automobiles*.

Cost Keeping

A Scientific Cost-Keeping System for Reinforced Concrete. John S. Nicholl. Detailed system of cost keeping as followed by the Aberthaw Construction Company. Charts. 6200 w. Engineering Magazine—Jan., 1913. No. 38685 B.

Keeping Concrete Costs. Morton C. Tuttle. Explains a method of obtaining construction costs during the progress of the work. 2500 w. Eng Rec—Jan. 4, 1913. No. 38801.

Cost Keeping for Reinforced-Concrete Buildings. W. P. Anderson. Explains in minute detail for the benefit of contractors in general the field and office methods of the Ferro Concrete Company. 4500 w. Engineering Magazine—April, 1913. No. 40909 B.

Cotton Mills

I. Some of the Problems Encountered in the Design, Construction and Equipment of the Modern Cotton Mill. Frank W. Reynolds. II. Modern Methods of Lighting in Cotton Mills. Albert L. Pearson. III. Air Conditioning for Textile Mills. Frank W. Parks. Three brief papers with short discussion. 4500 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42961 D.

Court House

Court House Planning. Henry D. Harlan. The present number discusses the essential requirements. Ills. 4000 w. Br Build—Jan., 1913. Serial, 1st part. No. 39570 D.

Court House

Crushers**Crushers**

No. 2 Crushing Plant of Natomas Consolidated. Richard H. Vail. Illustrated description of the largest of three rock-crushing plants in California. 4000 w. Eng & Min Jour—Sept. 13, 1913. No. 45119.

Domes

See Reinforced Concrete, under *Construction*.

Drainage

A Study of Variations in Run-Off Observations and Their Relation to Drainage. From a report to the Illinois Soc. of Engrs. and Survs. Shows the need of great caution in applying results observed in one locality to the solution of problems in another. 1800 w. Engng & Con—Feb. 5, 1913. No. 39697.

Some Drainage Projects in Southeastern Illinois. Charles A. Sheppard. From a paper before the Illinois Soc. of Engrs. and Survs. Discusses the drainage problem of Cahokia Creek and Wood River. 2500 w. Engng & Con—Feb. 5, 1913. No. 39699.

Yakima Indian Reservation Drainage Project. James W. Martin. An account of drainage of lands injured by over-use of water for irrigation. Ills. 4000 w. Eng. News—Feb. 20, 1913. No. 39974.

The Drainage of the Fens. Richard F. Grantham. Describes conditions and discusses how to provide for effectual drainage and prevent flooding of the land in times of heavy rainfall. Maps. 2500 w. Inst of Mech Engrs—July, 1913. No. 44458 N.

The Drainage of the River Ouse Basin. E. G. Crocker. Briefly describes the present drainage works and considers details of the necessary maintenance work. Map & Ills. 5500 w. Inst of Mech Engrs—July, 1913. No. 44460 N.

Land Drainage in Louisiana. A. M. Shaw. Describes the types of dredging plants, power plants for excavating ditches, and the methods of work. Ills. 3000 w. Eng News—Aug. 14, 1913. No. 44372.

Groundwater Movements, Drainage Methods and Open Channel Drainage. Louis Schmeer. A mathematical study. 4000 w. Engng & Con—Sept. 24, 1913. No. 45454.

Federal Aid to Drainage. J. R. Haswell. Brief review of the work undertaken along each line—farm drainage, tidal marsh work, flood prevention, land drainage, &c. 1800 w. Cornell Civ Engr—Oct., 1913. No. 46926 C.

Report on the Drainage of the Florida Everglades. Extracts from an important report by a board of engineers, and

CONSTRUCTION**Excavation**

other information. 3500 w. Eng News—Oct. 23, 1913. No. 46160.

A Study of the Comparative Economy and Convenience of Steam Operated and Electrically Operated Pumping Plants for Drainage. Abstract of a paper read before the Assn. of Drainage and Levee Districts of Illinois. An argument for the use of electric power for such plants, giving data of costs and efficiencies. 5000 w. Engng & Con—Oct. 1, 1913. No. 45624.

See Reclamation, under *Construction*; Drainage, under *Waterways and Harbors*, and Drainage, under *MINING AND METALLURGY, Mining*.

Drilling

Rock Drilling at the Kensico Dam. Frank Richards. Brief description of the dam for the storage reservoir of the N. Y. City water service, especially describing the electric air drills, drill wagon, drill sharpener, and giving the power cost. Ills. 2000 w. Compressed Air—March, 1913. No. 40430.

Earth Pressure

Lateral Pressure in Clay From Superimposed Loads. Walter L. Cowles. A study of the horizontal effect of a vertical superimposed load. 700 w. Jour W Soc of Engrs—Oct., 1912. No. 37740 D.

Earthquakes

See Panama Canal, under *Waterways and Harbors*.

Electric Power

Utilizing Electrical Energy in the Construction of the Commonwealth Pier at South Boston, Mass. Illustrated description of the plant used. 1000 w. Elec Rev & W Elect'n—Aug. 2, 1913. No. 44139.

See also Panama Canal, under *Waterways and Harbors*.

Engineering Fees

A German Code of Fees. A translation of the present German code, adopted in 1901 by six technical associations for fixing fees for architectural and engineering work. 2500 w. Eng News—Dec. 12, 1912. No. 38178.

Estimates

Methods of Estimating Construction Costs. Donald B. Fegles. Suggestions for estimating the quantities for building structures with particular reference to concrete slabs. Diagrams. 2000 w. Eng Rec—Nov. 2, 1912. No. 37225.

Excavation

Economic Analysis of Excavation Methods on a Typical Section of New York State Barge Canal Work. Emile Low. Ills. 2200 w. Engng & Con—May 21, 1913. No. 42311.

See Submarine Excavation, under *Waterways and Harbors*.

Consult Classification of the Index. See page 9.

Excavators**CONSTRUCTION****Fireproof****Excavators**

The Use of Electrically Operated Shovels for Building Foundation Excavation in Boston. Describes method of excavating in a congested district where smoke from a contractor's plant would be objectionable. Ills. 1000 w. Engng & Con—Jan. 22, 1913. No. 39326.

Performance and Power Consumption of a 2½ Cu. Yd. Electric Shovel. C. E. Hogle. Information concerning a shovel used in constructing a dam in Nevada, its operation and tests. 1000 w. Eng News—Jan. 23, 1913. No. 39374.

A Clamshell Bucket With Electric Motor Opening and Closing Attachment. Illustrated description. 1200 w. Engng & Con—July 16, 1913. No. 43817.

Exhibitions

The International Architectural Exhibition in Leipzig, 1913 (Die Internationale Baufach-Ausstellung mit Sonderausstellungen in Leipzig, 1913). J. Kollmann. Details of the exhibition to be opened in May. Ills. 8200 w. Zeit des Ver deutscher Ing—Feb. 15, 1913. No. 40538 D.

Factories

A Recent Type of Factory Construction. Describes a structure at Granite City, Ill. Molded concrete columns, girders, wall and roof slabs and sawtooth frames assembled at the site. 1000 w. Ir Age—Nov. 7, 1912. No. 37749 C.

Allowable Heights and Areas of Factory Buildings. Ira H. Woolson. Shows the danger of excessive heights, and gives a summary of the opinions of many fire chiefs. 2000 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42954 D.

The Construction and Equipment of Cotton Mills. A symposium on design, construction, lighting, heating and humidification. 3500 w. Ind Engng—July, 1913. No. 43461 C.

Factory Building with Reinforced Concrete Interior Construction. Illustrated description of a modern factory in Montreal. 1500 w. Engr, Lond—Aug. 29, 1913. No. 45044 A.

The Layout, Design and Equipment of Industrial Works. A. Home Morton. Detailed discussion of problems related to factories. 4500 w. Con Rec—Sept. 24, 1913. No. 45450.

See also Reinforced Concrete, under Construction.

Factory Buildings

The Fundamentals of Factory Design. George Service. Showing how the efficiency is dependent largely upon the layout and equipment. Ills. 2200 w. Con Rec—April 30, 1913. No. 42077.

The Design and Architectural Treat-

ment of the Shop. H. V. Lanchester. A critical discussion of details. General discussion. Ills. 7500 w. Jour Soc of Arts—April 25, 1913. No. 41911 A.

See also Reinforced Concrete, under Construction.

Failures

Collapse of Building in Kansas City. Robert S. Beard. Illustrated account of a wreck caused by failure of reinforced concrete and tile roof. 3500 w. Eng Rec—Nov. 2, 1912. No. 37227.

Historic Failures of Engineering Structures. Horace R. Thayer. Discusses the general causes of failure, giving brief descriptions of many disasters. Ills. Discussion. 15500 w. Pro Engrs' Soc of W Penn—June, 1913. No. 43762 D.

Fire Extinguishing

Extinguishing Fires with Sawdust. Edwin A. Barrier. Information concerning experiments for extinguishing fires in burning lacquer by means of sawdust, and the satisfactory results. 1500 w. Eng News—Jan 30, 1913. No. 39593.

Fire Houses

Gotham Building 45 Fire Houses Illustrates and describes new buildings for New York, all to be equipped with motor-propelled fire-fighting apparatus. 5000 w. Automobile—Dec. 5, 1912. No. 38083.

Fire Prevention

Fire Hazard and Fire Prevention in Foundries. Gives interesting results of an investigation made by New England foundrymen. 2500 w. Foundry—Feb., 1913. No. 39651.

Fireproof Building

Reminiscences of the Early Days of Fireproof Building Construction in New York City. M. A. Brooks. Notes on the Equitable Building, recently razed and the construction methods revealed. Ills. 1800 w. Eng News—Nov. 28, 1912. No. 37936.

Tests of Fireproof Construction for the City of New York. Harold Perrine. Describes the methods of conducting these tests upon full-size construction and upon samples. Ills. 2500 w. Sch of Mines Qr—April, 1913. No. 41697D.

The Fireproof Building; Its Advantages and Its Weaknesses. H. W. Forster. Discusses the many storied type of the office, or warehouse, or factory, containing combustible material. General discussion. 7000 w. Pro Engr Soc of W Penn—April, 1913. No. 42328 D.

Testing Room for Automobile Engines. Harry C. Spillman. Brief illustrated description of the fireproof test room of the Continental Motor Mfg. Co., Detroit,

Fire Protection

CONSTRUCTION

Floors

Mich. 1500 w. Ir Age—May 1, 1913. No. 41797 C.

Fireproof Building Construction. G. M. Cook. Discusses reinforced concrete construction and fireproof steel. Also the different materials for construction and protection. 6000 w. Ap Sci—May, 1913. No. 42915 C.

Is It Ignorance or Criminal Indifference? Sidney Graves Koon. Reviews a number of disastrous fires in large cities showing that by using wire glass, automatic sprinklers and available fire protection the fires could have been quickly extinguished. 2500 w. Sib Jour of Engng Oct., 1913. No. 46293 C.

See also Concrete and Factories, under Construction.

Fire Protection

The Life Hazard in Crowded Buildings Due to Inadequate Exits. H. F. J. Porter. Shows the impossibility of supplying sufficient stairways for loft buildings and suggests fire walls bisecting the buildings from cellar to roof. 3500 w. Jour Am Soc of Mech Engrs—May, 1913. No. 42407 D.

Debarment of City Conflagrations. Albert Blauvelt. Considers the things which cannot debar city conflagrations, and deduces the things which can combine for debarment, discussing the advantages and disadvantages of each. 4000 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42953 D.

Fire Protection of the Country House. Edwin O. Torbohm. Suggestions for means of quickly extinguishing a fire while still small, and for safeguarding danger points in a house. 3500 w. Archt & Bldg—June, 1913. No. 42962 C.

Fire Protection for Factory Workers. Discusses why lives are lost in factory fires, and how such loss can be avoided. Ills. 5000 w. Ind Engng—Oct, 1913. No. 45878 C.

See also Fire Protection, under MECHANICAL ENGINEERING, Machine Works and Foundries; Belts, under MECHANICAL ENGINEERING, Power and Transmission, and Fire Protection, under MINING AND METALLURGY, Mining.

Floors

Stress Measurements in a Cantilever, Flat-Slab, Reinforced Concrete Floor. From a paper by Arthur R. Lord, read before the Nat. Assn. of Cement Users. Describes a test made in Chicago, the methods employed and results. Ills. 2500 w. Eng Rec—Dec. 28, 1912. No. 38573.

Wearproof, Dustproof, and Waterproof Warehouse Flooring. S. W. Flesheim. Read before the Eastern Ice Assn. Brief-

ly considers wood floors, brick, composition, and concrete floors, favoring the last. 2000 w. Ice & Refrig—Dec., 1912. No. 38045 C.

Investigation of a Compound for Producing Dustless Concrete Floors. Albert C. Arend. Describes tests made, results, and states conclusions. 1800 w. Eng News—Dec. 12, 1912. No. 38180.

Statistical Limitations Upon the Steel Requirements in Reinforced Concrete Flat-Slab Floors. John R. Nichols, Jr. Aims to inquire into the limiting stresses and to establish their values for comparison with those obtained by current methods of designing floors. 1800 w. Pro Am Soc of Civ Engrs—April, 1913. No. 41644 F.

Statistical Limitations Upon the Steel Requirement in Reinforced-Concrete Flat Slab Floors. Discussion of the paper of John R. Nichols, Jr. 12000 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44787 F.

Molding Sand Cores for Floor Construction. Frederick Squires. Illustrated description of the use of sand panels for floor centering. 2000 w. Concrete-Cement Age—May, 1913. No. 42015.

The Construction and Finishing of Floor Slabs. C. A. P. Turner. Calls attention to the properties and characteristics of reinforced concrete that must be understood by constructors to avoid disaster. 2000 w. Con Rec—April 30, 1913. No. 42075.

The Treatment and Care of Floors. George W. Saums. Short paper discussing the need of preservation from dampness, splintering, etc. 1200 w. Am Wood Pres Assn—Jan., 1913. No. 43270 N.

The Flat-Slab System in Floor Construction. W. G. Ure. Describes advances during the past decade in reinforced concrete floors. Ills. 3500 w. Can Engr—June 12, 1913. No. 42858.

Methods of Designing the Flat Slab System. W. G. Ure. Discusses the fundamental principles upon which some of the methods are based with a comparison of results. Ills. 3300 w. Can Engr—June 19, 1913. No. 42992.

Field Made Plaster Cores for Floor Work. Frederick Squires. Illustrated description of the construction and use of the "pyroblock." 2500 w. Concrete-Cement-Age—June, 1913. No. 42809.

Two-Way Reinforced-Concrete and Tile Floor. Charles V. Wein. Illustrates and describes a system used extensively in Canada and abroad. 1200 w. Concrete-Cement Age—July, 1913. No. 43734.

Foundation Plates

CONSTRUCTION

Foundations

Composition Flooring. H. M. Hooker. A personal study of composition flooring, its history, description, characteristics, construction, etc. 1800 w. Pro Engrs' Soc of W Penn—July, 1913. No. 44516 D.

Cresosoted Wood Blocks for Factory and Warehouse Floors. F. A. Weaver. Describes the proper construction and states the advantages claimed. 1500 w. Eng Rec—Aug. 16, 1913. No. 44430.

A Fire, Load and Water Test upon Cinder-Concrete, Terra-Cotta, and Gypsum Floor Arches. Harold Perrine. Report on a test made for Albert-Oliver at the Columbia Fire Testing Station. Ills. 1500 w. Eng News—Aug. 21, 1913. No. 44576.

Fire, Load and Water Test of Floor Arches. Brief illustrated account of an interesting test in which the qualities of gypsum, terra cotta tile, and reinforced concrete were tested. 600 w. Sci Am—Aug. 9, 1913. No. 44216.

Hollow-Columned Floors of Reinforced Concrete in the United States (Balkloze vloeren van gewapend beton in de Vereenigde Staten van Noord-Amerika). J. K. Tromp. Describes system of reinforcing floors supported by Hollow columns. Ills. 4500 w. De Ingenieur—Sept. 13, 1913. No. 46097 D.

See also Reinforced Concrete Slabs, under *Materials of Construction*, and Floor Tests, under *Measurement*.

Foundation Plates

Foundation Plates for Simple Loading with Particular Reference to Circular Plates (Ueber Fundamentplatten für Einzellasten unter besonderer Berücksichtigung der Kreisplatte). Dr. Lewe. A study of stresses in ribbed plates, square, octagonal, circular, etc. Ills. 2600 w. Beton u Eisen—May 26, 1913. No. 43021 E.

See also Foundations, under *Bridges*.

Foundations

The Hard Pan Test at the New Cook County Hospital. Frank A. Randall. Record of a hard pan test made in Chicago in connection with caisson foundation work. Ills. Discussion. 6500 w. Jour W Soc of Engrs—Oct., 1912. No. 37739 D.

Concrete Pile Footings for the 42-Story L. C. Smith Building, Seattle, Wash. Describes conditions that made necessary the foundations constructed. Ills. 1800 w. Eng News—Nov. 14, 1912. No. 37593.

A Novel Type of Cantilever Foundation. Brief illustrated description of concrete cantilever footings of a 12-story

loft building in New York City. 500 w. Eng News—Nov. 28, 1912. No. 37938.

Method of Building Foundations for a Typical Substation, with Special Reference to the Excavation. Alden W. Welch. Detailed description of a very deep excavation dug by using a steam shovel, and of other construction work in this connection. 700 w. Engng & Con—Jan. 15, 1913. No. 39183.

Proportioning of Foundations for Columns and Walls. Ernest McCullough. Explains method used by the writer, illustrating by examples. 1500 w. Eng News—March 6, 1913. No. 40354.

Foundations of the Northwestern Mutual Life Building. Illustrates and describes methods used at Milwaukee, Wis., in constructing massive concrete and pile footings in sheeted trenches in very cold weather. 1500 w. Eng Rec—March 1, 1913. No. 40263.

The Construction of Foundations for a Large Boiler House. Alden W. Welch. Describes a contract covering the excavation for and building of the foundations for the boiler house of a power station. 1800 w. Engng & Con—April 16, 1913. No. 41276.

Methods Used for Underpinning Adjacent Buildings and for Constructing the Pneumatic Caisson Foundations of the 50 Broad Street Building, New York City. F. E. Cudworth. Describes methods used in foundations for a 20-story office building. Ills. 2000 w. Engng & Con—Aug. 27, 1913. No. 44777.

The Statical Calculation of Reinforced Concrete Foundation Beds (Ueber die statische Berechnung von Eisenbetonfundamentplatten). H. Hövermann. A method for determining loads at any point of the structure in the preparation of foundations. Ills. 3000 w. Beton u Eisen—Aug. 6, 1913. No. 44638 E.

Special Concrete Foundations in the Manila Port District. John W. Graham. From the "Qr. Bul.," Bureau of Pub. Works, Manila. Describes this section of reclaimed land and the specially designed concrete-floor construction. Ills. 1400 w. Eng News—Sept. 18, 1913. No. 45223.

Design of Footings in Reinforced Concrete. A. N. Worthington. Explains a method recently employed in numerous buildings with unvarying success. Ills. 1000 w. Can Engr—Oct. 9, 1913. No. 45788.

Shallow Foundations on Muddy and Swampy Land and Reconstruction by the Aid of Such Treatment (Flachgründungen auf Schlamm-und Moorboden und Rekonstruktionen mit Hilfe dieses Verfahrens). Mich. Heimbach. Plans and de-

Framework

CONSTRUCTION

Piles

tails of large bearing foundations in such instances. Serial, 1st part. 2700 w. Beton u Eisen—Oct. 2, 1913. No. 46030 E.

See also Caissons, under *Construction*.

Framework

Girders in the Grand Central Terminal, New York City. Drawings and description of massive sections and field connections of large members in the lofty irregular framework designed for heavy wind and static stresses. 1500 w. Eng Rec—Jan. 18, 1913. No. 39192.

"Framed Supports" According to the New Austrian Regulations (Die "rahmenartigen Tragwerke" nach der neuen österreichischen ministerialvorschrift). Karl Valek. An interpretation of the regulation. Diagrams. Serial, 1st part. 3900 w. Beton u Eisen—Jan. 3, 1913. No. 40029 E.

Some Notes on the Calculation of Rectangularly Compounded Framework by the Use of Clapeyron's Equations (Einiges über die Berechnung von aus Rechtecken zusammengesetzten Fachwerken mit Hilfe der Clapeyronschen Gleichungen.) Ph. Leip. Mathematical discussion on the building up of columns, beams, struts, etc. Diagrams. 5000 w. Beton u Eisen—Aug. 25, 1913. No. 46027 E.

Gas Holders

Roof Construction for the New Gas-holder in Berlin-Tegel (Die Dachkonstruktion über dem neuen Gasbehälter in Berlin-Tegel). A. Mecklenbeck. Details of circular girder roof construction. Ills. Serial. 1st part. 2800 w. Zeitschr des Ver deutscher Ing—Nov. 9, 1912. No. 38446 D.

Failure of a Spiral-Guided Gas-Holder in Steel Tank at Ilkeston. Illustrated detailed description of the holder and its failure as described by eye-witnesses, with explanation of the accident and discussion of related subjects. Plate. 6500 w. Engng—May 2, 1913. Serial. 1st part. No. 42004 A.

Gas-holders: Their Construction and Use. Abstract of a lecture delivered by Ernst Körting before the German Gas & Water Assn. Gives a representative series showing the development of holders with comparison. Ills. 2000 w. Am Gas Lgt Jour—Aug. 18, 1913. No. 44434.

Grading

Kassabick, or Land Levelling Scoop. Illustrated description of an invention especially useful in irrigation work. 1200 w. Engr, Lond—Nov. 22, 1912. No. 38037 A.

Method and Cost of Leveling Dredged Over Ground with Electrically-Driven Drag Scraper James C. Bennett. De-

scribes the equipment used giving statement of costs. 1500 w. Engng & Con—Dec. 4, 1912. No. 38048.

Grain Elevators

See also Concrete, under *Construction*.

Granaries

Enlargement of the Königsberg Granary (Die Erweiterungsbauten des Getreidespeichers in Königsberg). M. Buhle. Details of construction adopted for a 20,000-ton addition. Ills. 2600 w. Zeitschr des Ver deutscher Ing—Jan. 11, 1913. No. 40038 D.

Grandstand

Grandstand for the Brooklyn Baseball Club. Drawings and description of a large two-story street pavilion, with cantilever trusses supporting concrete floors and two office stories over the entrance rotunda. 1600 w. Eng Rec—March 8, 1913. No. 40373.

Hospitals

New General Hospital, Toronto. Illustrates and describes interesting construction features. 4000 w. Con Rec—July 23, 1913. No. 43871.

Labor

Construction by Day Labor in Indianapolis. W. N. Jones. Illustrates and describes the methods and costs of constructing concrete vaulting over the city reservoir. 2500 w. Eng Rec—April 19, 1913. No. 41353.

Methods

Business Methods in Construction Work. James L. Stuart. Explains methods used, illustrating by examples. General discussion. 5500 w. Jour Cleveland Engng Soc—Sept., 1913. No. 45428 D.

Mill Buildings

A Modern Steel Mill Building. Arthur W. Harrington. Illustrated description of a structure recently erected in Water-town, N. Y., of steel frame and concrete walls. 1000 w. Cornell Civ Engr—Jan., 1913. No. 39393 C.

Partitions

Partitions for Factories and Industrial Buildings. Henry Grattan Tyrrell. This first instalment of a serial is devoted to cement, plaster, and terra-cotta systems. Ills. 3500 w. Engineering Magazine—Sept., 1913. No. 44768 B.

Partitions for Factories and Industrial Buildings. Henry Grattan Tyrrell. This second and concluding article of a serial considers framed partitions of metal and wood. Ills. 3000 w. Engineering Magazine—Oct., 1913. No. 45543 B.

Piles

See Reinforced Concrete, under *Materials of Construction*.

Consult Classification of the Index. See page 9.

Piling

CONSTRUCTION

Reclamation

The Making and Driving of Reinforced-Concrete Piles. Gower Bouverie Raynor Pimm. Deals with the construction of Ferrycarrig Bridge, Co. Wexford. Ills. 1500 w. Inst of Civ Engrs—No. 4017. No. 39294 N.

Large Concrete Pile Installation. Gives data on preliminary bearing tests and details of driving more than 11,000 cast-in-place piles for steel plant foundations. Ills. 2000 w. Eng Rec—Jan. 11, 1913. No. 38953.

Reinforced Concrete Sheet Piling (Damplanken van gewapend beton). W. Lammers. Details of reinforcing systems available for keyed piling, and methods for driving. Ills. 1500 w. De Ingenieur—Dec. 14, 1912. No. 39059 D.

Some Experiences with Concrete Piles in Chicago. J. Norman Jensen. Gives experiences with three different forms of concrete pile. Ills. 2500 w. Eng News—Feb. 27, 1913. No. 40238.

Modern Systems of Steel Sheet Piling. Illustrates and describes the Ransome interlocking steel piling and its applications for cofferdams and allied constructions. 1500 w. Archt, Lond—July 4, 1913. Serial, 1st part. No. 43702 A.

Resistance of Piling (Résistance des Pieux. J. Bénabeng. A study of inclined piling, vertical piling, anchorage, etc. Ills. 8000 w. Ann de Ponts et Chaussées—May-June, 1913. No. 43561 E. + F.

Concrete Socket Piling. K. D. MacLean. Describes pier substructure construction, especially the concrete piles, giving tests. Ills. 2200 w. W Engng—Aug., 1913. No. 44388 C.

See Foundations, under Construction.

Post-Office

New U. S. Post-Office Building for New York. Illustrated description of the new building on 8th Ave., 31st to 33d St., and its machinery for handling the mails. 1000 w. Archt & Bldg—April, 1913. No. 42321 C.

Rams

Compressed-Air Hand Pavement Rams (Druckluft-Handpflasterrammen). M. Kiecksee. Details of a new pneumatic ram ranging in size from that used in setting mosaic floors to street pavements. Ills. 1300 w. Zeit des Ver deutscher Ing—June 28, 1913. No. 43534 D.

Razing

Methods and General Costs of Taking Down a 175-foot Steel Stack and Removing a Bucket Coal Conveyor. Alden W. Welch. Detailed discussion of the work. 1800 w. Engng & Con—Dec. 4, 1912. No. 38052.

Reclamation

Reclaiming a Large Tract by River Protection Work at Kansas City. N. M. Fitch. Map and description of work in Clay Co., Mo., employing several types of levee and dike construction, including mattress revetment work. 2500 w. Eng Rec—Dec. 28, 1912. No. 38575.

Municipal Reclamation of Waste Lands. Burt A. Heinly. An account of the planting of trees on arid plains at Los Angeles, to be sold, when grown, for fence posts and telegraph poles. Ills. 1500 w. Munic Jour—Dec. 19, 1912. No. 38318.

The Problem of Interstate Swamp Drainage; The St. Francis Basin. M. O. Leighton. Outlines the physical conditions of this basin lying in S.-E. Missouri and N.-E. Arkansas on the west bank of the Mississippi River, and the problems connected with its improvement. Ills. & Map. 3000 w. Engng & Con—Dec. 11, 1912. No. 38148.

The Problem of Interstate Swamp Drainage; The Red River of the North. M. O. Leighton. Map with description of the valley showing the drainage requirements, and proving that the Red River will be overtaxed under future conditions of intensive drainage. 5000 w. Engng & Con—Jan. 1, 1913. No. 38774.

The Problem of Interstate Swamp Drainage. The Dismal Swamp. M. O. Leighton. The origin of this swamp and the engineering features of its drainage are explained. Map. 1800 w. Engng & Con—March 12, 1913. No. 40455.

The National Aspect of the Reclamation of Swamp and Overflowed Lands. Edmund T. Perkins. Argues for a general plan covering the entire drainage basin, under the control of the Federal government. Discussion. 6800 w. Jour W Soc of Engrs—Feb., 1913. No. 40408 D.

The Work of the United States Reclamation Service. D. P. Dale. Explains the object of the service, the plan of the work, special features, and the present status. 2500 w. Wis Engr—Feb., 1913. No. 41265 C.

The Drainage of Egypt. Hanbury Brown. A reply to Sir William Willcocks' lecture in Cairo, which was a criticism of the drainage scheme of lower Egypt; also criticises past policy. 3000 w. Engr, Lond—March 21, 1913. Serial, 1st part. No. 41020 A.

Reclaiming Dredged Lands in California. A. H. Martin. An illustrated report of results with various crops. 1500 w. Min & Engng Wld—June 7, 1913. No. 42723.

Reinforced Concrete

CONSTRUCTION

Reinforced Concrete

Prize Design for Coney Island Beach Reclamation. First prize. Plan of George E. Jackson, with description. 1200 w. Eng News—Aug. 14, 1913. No. 44373.

Coast Sand Dunes, Sand Spits and Sand Wastes. Gerald O. Case. The first of a series of articles dealing with their reclamation. Ills. 6000 w. Surveyor—Sept. 5, 1913. Serial, 1st part. No. 45146 A.

The National Drainage Congress Bill for Government Reclamation of Swamp Lands. A bill to establish a drainage fund. 3500 w. Engng & Con—Oct. 1, 1913. No. 45625.

Sutter Basin Reclamation Project. Information from reports by George N. Randle and by Edward F. Haas, concerning this California project. Ills. 3000 w. Engng—Oct., 1913. No. 46358 C.

See also Drainage, under *Construction*.

Reinforced Concrete

Notes on the Theory of the Required Forms in the Construction of Reinforced Concrete Ribbed Domes (Beitrag zur Theorie der im Eisenbetonbau gebräuchlichen Form der Rippenkuppel). K. W. Mautner. Derivation of formulae for domes and arches. Ills. 5600 w. Beton u Eisen—Oct. 2, 1912. No. 37425 E.

The Reinforced Concrete Dome at Saint Blasius (Die Eisenbetonkuppel im Sanct Blasien). A. Kleinlogel. Details in the construction of a dome of 50-foot span for the catholic cathedral. Ills. 3200 w. Beton u Eisen—Oct. 2, 1912. No. 37424 E.

The Municipal Gas Plant of Helsingfors, Finland (Das städtisches Gaswerk in Helsingfors, Finnland). J. Castrén. Describes construction, and gives formulae for snow loads, wind bracing, etc. Ills. 2400 w. Beton u Eisen. Oct. 2, 1912. No. 37426 E.

Failure of a Reinforced Concrete Theatre in Course of Construction, Cincinnati, Ohio. Clifford M. Stegner. Illustrated account of the failure and its cause. 1500 w. Eng News—Dec. 26, 1912. No. 38597.

Formulas and Diagrams for the Design of Rigid Frames for Steel and Reinforced Concrete. Sanford E. Thompson and Edward Smulaki. Read before the Nat. Assn. of Cement Users. Gives formulae and diagrams for simplifying the design. 3000 w. Engng & Con—Jan. 15, 1913. No. 39184.

The Practical Side of Reinforced-Concrete Construction. E. D. Wells. Pres. address before the Concrete Inst., London. From *Concrete & Constructional Engr.*, London. Discusses cement, aggregates,

mixing, testing, etc. 6000 w. Cement—Oct., 1912. No. 39315 C.

Reinforced Concrete Undertakings in the Province of Ravenna (Nota sui lavori in cemento armato in provincia di Ravenna). M. Perilli. Review of some construction work now in progress involving the use of reinforced concrete. Ills. Serial. 1st part. 2800 w. Il Cemento—Dec. 30, 1912. Uo. 39093 D.

Construction of an Eight-Story Shop-Building. John N. McMichaels. Illustrates and describes the structural features of a building in Detroit. 1500 w. Conc.-Cem. Age—Feb., 1913. No. 39892.

Reinforced Concrete for Railway Sheds. Gives a comparison of cost between the ordinary style of shed used and one built of reinforced concrete. Ills. 1500 w. Engr, Lond—Jan. 31, 1913. No. 39816 A.

Reinforced Concrete Bicycle Race Track in Zürich (Radrennbahn aus Eisenbeton in Zürich). Jaro Polirka. Details of construction of oval track highly inclined at curves. Ills. 5600 w. Beton u Eisen—Jan. 3, 1913. No. 40028 E.

Calculations on Reinforced Concrete Walls (Calcul des Hourdis en Beton Armé). Notes added to the report of the Consul General of Bridges and Highways, relating to bridge piers and retaining walls. 24000 w. Ann d Ponts et Chaussées—Nov., 1912. No. 40073 E + F.

Industrial Plant with All Structures Built of Reinforced Concrete. W. J. Knight. Illustrated description of buildings, including a large machine shop with sawtooth construction. 3500 w. Eng Rec—March 8, 1913. No. 40366.

Method of Constructing an Eight-Story Reinforced Concrete Warehouse, Using Special Column Forms and Concreting Plant. Illustrated description of a structure in Chicago for the Larkin Co. 1500 w. Engng & Con—Feb. 26, 1913. No. 40231.

Reinforced-Concrete Coal Trestle at Gilbertville, Mass. Illustrated description of the design and construction. 800 w. Eng Rec—March 15, 1913. No. 40648.

Reinforced Concrete Construction in the New Munich Customs House (Die Eisenbetonkonstruktionen des Hauptzollamtsneubaues in München). Herr Kaiser. Illustrated description. 2000 w. Beton u Eisen—Feb. 13, 1913. No. 40523 E.

Reinforced Concrete Studies. J. K. Finch and W. F. Thoman. First of a series of articles discussing the design and method of construction of structures in reinforced concrete. The hollow dam of the buttress type is discussed. Ills. 5000 w. Sch of Mines Qr—April, 1913. No. 41695 D.

Consult Classification of the Index. See page 9.

Reinforced Concrete

CONSTRUCTION

Roofs

The Unit Method of Reinforced Concrete Construction. John E. Conzelman. Briefly considers the general subject of unit construction and its advantages, and the work done under unit methods, giving report of tests. General discussion. Ills. 5000 w. Jour Assn of Engng Soc—April, 1913. No. 41286 C.

Reinforced Concrete. Percy J. Waldram. Extracts from a paper read before the Surveyors' Inst. A discussion of its uses and limitations. 4000 w. Surveyor—April 11, 1913. No. 41383 A.

A Reinforced-Concrete Beacon Tower, Alexandria, Egypt. Illustrated detailed description of the structure and its construction. 1500 w. Eng News—April 10, 1913. No. 41166.

Tests of Reinforced Concrete Buildings Under Load. Arthur N. Talbot and Willis A. Slater. Records the results of three field tests made on reinforced concrete floor systems, describing the method of testing. Ills. 104 pp. Bul Univ of Ill, No. 64—Jan. 13, 1913. No. 42480 N.

A Large Reinforced Concrete Factory at Berlin, Ontario. H. F. H. Hertzberg. Illustrated description. 2500 w. Con Rec—April 30, 1913. No. 42076.

Reinforced Concrete in Theatres. Gives interesting examples of both European and American practice. Ills. 1600 w. Con Rec—April 30, 1913. No. 42074.

Reinforced Concrete in Conjunction with Masonry (Eisenbeton in Verbindung mit Mauerwerk). A. Kleinlogel. Suggestions for effecting a durable bond in such construction. Ills. 2600 w. Beton u Eisen—April 21, 1913. No. 42127 E.

Doubly Reinforced Concrete Sections (Doppelt armierte Eisenbeton-Querschnitte). Otto Leuprecht. A study of reaction against stress under eccentric loads and straight bends. Diagrams. 2500 w. Schweiz Bau—June 7, 1913. No. 43024 D.

Reinforced-Concrete Factory Buildings. Harry C. Spillman. A statement of their advantages. Ills. 1500 w. Ind Engng—July, 1913. No. 43458 C.

Reinforced-Concrete in Factory Construction. Illustrates and describes details of mill and dam work at Milton, N. H. 2000 w. Concrete-Cement Age—July, 1913. No. 43731.

Reinforced-Concrete Wall Footings and Column Footings. Arthur N. Talbot. Describes tests of 114 wall footings and 83 column footings. Ills. 114 pp. Bul Univ of Ill, No. 67—March 31, 1913. No. 43616 N.

The Application of Reinforced Concrete. G. B. R. Pimm. Considers some of the more general applications. Dis-

cussion. 2200 w. Surveyor—July 25, 1913. Serial, 1st part. No. 44178 A.

The Application of Unit-Methods to Reinforced Concrete Building Construction. Charles D. Watson. Illustrated description of unit built structures, explaining their advantages. Discussion. 10500 w. Jour Cleveland Engng Soc—Sept., 1913. No. 45429 D.

Reinforced Concrete Coal and Ash Bunker for the Seelbach Hotel, Louisville, Ky. G. D. Crain, Jr. Drawings and description. 1500 w. Engng & Con—Sept. 24, 1913. No. 45453.

See also Abutments and Reinforced Concrete, under *Bridges*; Buildings, Roofs, Floors, Retaining Walls and Theatres, under *Construction*; Reinforced-Concrete Columns, Beams, and Reinforced-Concrete, under *Materials of Construction*; Stresses, under *Measurement*; Reinforced-Concrete, under *Roads and Pavements*; Canal Lining Dams, Reservoirs, under *Water Supply*, and Shore Protection, under *Waterways and Harbors*.

Retaining Walls

Design of Retaining Walls. Alfred W. Hoffmann. Reviews the theory, construction and economy of such structures, the need of studying the conditions in each case. Discusses the most modern types of reinforced-concrete retaining walls. Ills. 5000 w. Ry Engng & Main of Way—March, 1912. Serial, 1st part. No. 40792.

Reinforced Concrete. Albert J. Hines. Describes and illustrates a wall of unusual design, constructed on the Nickel Plate in East Cleveland. 600 w. Cornell Civ Engr—March, 1913. No. 40875 C.

Design of Standard Reinforced-Concrete Retaining Walls. H. M. Gibb. Gives a quick, accurate and simple method to apply to all common types, which gives results within about 10% of the rigid analysis. Ills. 1200 w. Eng News—July 24, 1913. No. 43882.

Rock Slides

A Suggested Method of Preventing Rock Slides. George S. Rice. Describes a proposed scheme of constructing under ground retaining walls and discusses the question of its application at Culebra, Cut. Discussion. Ills. 15000 w. Jour W Soc of Engrs—Sept., 1913. No. 46286 D.

See Dam Design, under *Water Supply*, and Paris, under *Waterways and Harbors*.

Roofs

Concourse Roof, Grand Central Terminal, New York City. Brief description and drawings of the framing of lofty five-centered arch roof truss and suspended ceiling. 1500 w. Eng Rec—Feb. 22, 1913. No. 40103.

Sanitation

Suspended Roofs of Reinforced Concrete (Die freitragenden Dächer in Eisenbeton). L. Geusen. Formulæ for calculating wind pressures, distributed loads, in this first of two articles. Diagrams. Serial. 1st part. 4500 w. Beton u Eisen—April 1, 1913. No. 41432 E.

The Calculation of Arched Roofs (Die Berechnung der Bogendecken). O. Domke. Formulæ for the determination of stresses with reinforced concrete structures. Diagrams. 5600 w. Beton u Eisen—Aug. 6, 1913. No. 44639 E.

Stress Coefficients for Roof Trusses. Carl E. Schirmer. Gives data on the design of roof trusses arranged in convenient form for the designer. Supplement. 1200 w. Mach, N Y—Sept., 1913. No. 44841 C.

See also Concrete Roofs, under *Construction*.

Sanitation

Camp Hill View Sanitation, Catskill Aqueduct. Arthur W. Tidd. General description of the camp and account of the sanitary provisions. Ills. 6000 w. Eng News—Oct. 16, 1913. No. 45933.

Schools

American School Houses (Amerikanische Volksschulhäuser. Karl Hin-träger. Brief descriptions of some typical American schools in the larger cities, and their designing architects. Ills. 3000 w. Zeit des Öst Ing u Arch Ver—Jan. 31, 1913. No. 40548 D.

Shed Design

An Economical Design for a Timber Cotton Shed. E. S. Pennebaker, Jr. Description of a shed recently erected on the docks at Mobile, Ala., to provide storage for cotton. Discussion. Ills. 5500 w. Jour W Soc of Engrs—Feb., 1913. No. 40411 D.

Skyscrapers

Why the Giant Skyscrapers Are Safe. J. F. Springer. Illustrates and describes methods of foundations construction for high buildings. 2500 w. Cassier's—June, 1913. No. 42866 B.

Specifications

Specifications. O. S. Beyer, Jr. Deals with the importance and value of good specifications, the field in which they may be employed, and related subjects. General discussion. 5500 w. Pro W Ry Clu—Dec. 17, 1912. No. 39334 C.

Stacks

Calculations for Stability of Chimneys. Leonard Goodday. Detailed explanation of method used in calculating a chimney for an engine house. 1200 w. Can Engr—Jan. 16, 1913. No. 39382.

Segmental Chimney Construction in France. Explains the advantages of rein-

CONSTRUCTION

forced concrete for chimney construction and illustrates applications and structures erected. 2500 w. Concrete-Cement Age—Jan., 1913. No. 39218.

Baldwin on Chimneys with New Charts for Use in Connection with House Heating and Power Plants. Discusses chimney design, how to determine the limit of a chimney and related subjects. Ills. 3000 w. Heat & Vent Mag—Oct, 1913. No. 46299.

Chimneys. W. H. Grantham. Discusses conditions to be considered in deciding upon the type of chimney in the present article. 1700 w. Mech Wld—Sept. 19, 1913. Serial, 1st part. No. 45564 A.

See same heading, under *MECHANICAL ENGINEERING, Steam Engineering*.

Stairway Collapse

Failure of a Stairway to Elevated Railway Station, Brooklyn, N. Y. An account of the failure at the Nostrand Ave. station of the Atlantic Ave. line, on Dec. 19. Ills. 1200 w. Eng News—Dec. 26, 1912. No. 38598.

Steam Shovels

Some Records of Steam Shovel Ditch Excavation. Operations and Costs on the Los Angeles Aqueduct. D. W. Peterson, in *Western Engng*. Gives steam shovel cost data and operating records. 3500 w. Engng & Con—Feb. 26, 1913. No. 40229.

Steel Frame

Steel Framework of St. Jean Baptiste Church. Illustrates and describes details of a Roman Catholic church in New York, having a large double dome supported on columns and roof trusses, and two towers with circular framework and conical roofs. 2000 w. Eng Rec—Oct. 18, 1913. No. 45941.

Steel Towers

Designing Steel Towers for Wood Tanks. A complete analysis of the stresses in the tower structure. Ills. 5000 w. Mach, N Y—Jan., 1913. Serial. 1st part. No. 38720 C.

Analysis of Steel Towers. Isidore Delson. Explains the determination of action of wind, loads and design of tower bents. Line drawings. 2200 w. Eng Rec—Sept. 13, 1913. No. 45111.

Steelwork

Modern Steel Building Construction. Frank N. Jackson, and Bernard Dicksee. Describes the preparation of the designs and drawings, and the rules governing the design of steel-frame buildings in England. 12500 w. Jour Roy Inst of British Archts—April 26, 1913. No. 42793 N.

Steelwork Design

Design of the Steelwork and Methods and Cost of Its Erection for an Armory Having Long-Span Three-Hinged Arches.

Stone Crushers

Deals with the armory being erected for the University of Illinois. Ills. 2000 w. Engng & Con—Aug. 6, 1913. No. 44212.

Stone Crushers

The World's Largest Stone Crushing Plant. Illustrated description of the electrically-driven rock-crushing plant at Calcite, Mich. 2500 w. Elec Rev & W Elect'n—April 26, 1913. No. 41654.

Stucco

Preventing Settlement Cracks in Stucco Houses. Ernest McCullough. Explains how to minimize effects of settlement and shrinkage. Ills. 2000 w. Cement & Eng News—May, 1913. No. 42205.

Swimming Bath

Southampton's Open-Air Swimming Bath. J. A. Crowther. Illustrated description of the construction of a ferro-concrete bath in tidal waters. 1200 w. Surveyor—Feb. 28, 1913. No. 40474 A.

Test Building

Details of an Engine Test Building. Illustrated description of general features and of door, window, heating duct, drain and floor construction of a building in LaPorte, Ind. 1500 w. Eng Rec—Jan. 11, 1913. No. 38956.

Theatres

The New Belleville Theatre in Paris (Le nouveau théâtre de Belleville à Paris). Details of large reinforced concrete theatre with 1500 seats. Ills. 2000 w. Genie Civil—March 8, 1913. No. 40599 D.

The Champs-Élysées Theater, Paris (Le Théâtre des Champs-Élysées, à Paris). Louis Gellusseau. Illustrated description of the new structure, and the use of reinforced concrete in its construction. 3500 w. Genie Civil—April 5, 1913. No. 41527 D.

Timber Preservation

Report of Committee XVII—On Wood Preservation. Considers the merits of preservatives and their use with related subjects. 3500 w. Bul Am Ry Engng Assn—Jan., 1913. No. 40223 F.

Tornado Effects

The Effect of the Omaha Tornado on Structures. Albert C. Arend. Illustrated description of the tornado and its effects, with comments on the building construction that best withstood the storm. 2000 w. Eng News—May 1, 1913. No. 41862.

Tower Cranes

English Tower Cranes for Building Construction. Illustrated description of a type of erecting plant used very extensively in England. 800 w. Eng News—Dec. 5, 1912. No. 38060.

Tunneling Machines

The Karns Tunneling Machine. O. J. Grimes. A rotating radial cutting head

CONSTRUCTION

driven by compressed air for driving six-foot tunnels. Ills. 1800 w. Eng News—March 6, 1913. No. 40563.

Tunnel Lining

Self-Supporting Tunnel-Lining Blocks. Illustrated description of a lining which is intended to eliminate timbering and afford immediate protection against falling roof. 1200 w. Eng Rec—Aug. 9, 1913. No. 44238.

Concreting a Tunnel by Compressed Air. A. C. Everham. Brief illustrated description of work by the Kansas City Terminal Ry. at Kansas City, Mo. 1200 w. Eng News—July 31, 1913. No. 44111.

Tunnels

Concrete Lined Aqueduct Tunnel Driven Under Unusual Difficulties. An account of the driving a tunnel for the water-works system of Santa Barbara, Cal., through the Santa Ynez Mts., encountering caving ground, inflows of water, and highly inflammable gas. 4500 w. Eng Rec—Nov. 9, 1912. No. 37357.

Methods and Cost of Constructing the Municipal Water Tunnel at Santa Barbara, Calif. Information from a paper by Lee M. Hyde, read before the League of Calif. Munics. Describes the difficult problems encountered. 3500 w. Engng & Con—Oct. 30, 1912. No. 37196.

Woolwich Footway Tunnel Opened. Illustrated description of the work. 1000 w. Surveyor—Nov. 1, 1912. No. 37392 A.

Driving and Lining the New Sand Patch Tunnel. Illustrated description of rapid work on the B. & O. R. R. improvement. 2000 w. Eng Rec—Dec. 7, 1912. No. 38078.

Tunnel Memorials. Illustrated description of the Bramhope memorial, erected to the memory of the men who lost their lives in the difficult construction work. 1000 w. Engr, Lond—Dec. 20, 1912. No. 38896 A.

Some Difficulties Encountered in Tunnel and Subway Construction in Boston. Frederic I. Winslow. Considers pipe changes in connection with the various subways, two compressed air tunnels, the building of the Deer Island reservoir, and other work. Ills. 3000 w. Jour N. Eng W-Wks Assn.—Dec., 1912. No. 39529 F.

Elimination of Timbering in Rock Tunneling: A Proposal. John F. O'Rourke. Illustrates and describes method using interlocking concrete blocks. 1300 w. Eng News—Feb. 13, 1913. No. 39862.

Relining the Mauvages Tunnel on the Marne Ship Canal. Francis B. Mann. Illustrates and describes the placing of a concrete lining without serious interrup-

Tunnels

CONSTRUCTION

Waterproofing

tion of traffic on the canal. 2000 w. Eng Rec—Feb. 22, 1913. No. 40101.

The Mount Royal Tunnel of the Canadian Northern Railway. Illustrations and notes on the progress of this work. 3000 w. Can Engr—Feb. 6, 1913. No. 39823.

Novel Tunnel Work on the Cleveland Short Line Ry. Drawings and description of two tunnels built in open cut and backfilled. One has a heavy lining of reinforced concrete; the other has two sewers carried through the crown. 1500 w. Eng News—March 20, 1913. No. 40738.

Method and Cost of Constructing in Earth a Circular Brick-Lined Water Works Tunnel 8 Ft. in Diameter and 1,216 Ft. Long. A creditable example of day-labor construction in Chicago. Ills. 3500 w. Engng & Con—April 2, 1913. No. 41024.

Driving and Lining a Power Tunnel at Tallulah Falls, Georgia. J. H. Graham. Illustrates and describes details of difficult rock work and pneumatic placing of concrete. 4000 w. Eng Rec—April 12, 1913. No. 41183.

Tunnel Lining on the Virginian Railway. Illustrated account of the methods used in placing concrete linings in eighteen main-line tunnels without interruption of traffic. 1800 w. Ry Age Gaz—June 20, 1913. No. 43100.

Astoria Tunnel Holed Through. Illustrates and describes the completion of a bore to carry gas mains under the East River, New York. 1000 w. Eng Rec—July 26, 1913. No. 43933.

The Astoria-Bronx Tunnel, New York Consolidated Gas Company. Brief illustrated account of this recently completed tunnel from Astoria to the Bronx under the East River, New York. 1800 w. Am Gas Lgt Jour—Aug. 4, 1913. No. 44085.

Tunnel Excavation on Section 1A of the Lexington Avenue Subway in New York. Describes methods used in building the tunnel under St. Paul's churchyard and the old Astor House, in New York City. Ills. 2500 w. Eng Rec—Aug. 9, 1913. No. 44237.

Building a Four-Tube Steel Tunnel in Sections. Illustrated description of details of construction work of the Harlem River tunnel carried on by the Hoff system. 2000 w. Ir Trd Rev—Sept. 25, 1913. No. 45437.

Progress of the New Harlem River Tunnel. Gives a resumé of the system used for the 4-track tunnel of the Lexington Ave. subway. Ills. 1200 w. Sci Am—Sept. 27, 1913. No. 45426.

Difficult Tunnel Work on the Metropolitan Railway of Paris, France. Gives par-

ticulars of exceptional work, abstracted from an article by Mr. Godfernaux in the *Rev Gen. des Chemins de Fer*. Ills. 1500 w. Eng News—Sept. 11, 1913. No. 45072.

Blount and Hayden Mountain Tunnels. Comparison of materials and conditions encountered and of the methods employed in driving two double-track bores. Ills. 1500 w. Eng Rec—Aug. 30, 1913. No. 44892.

Construction Plant and Methods Used in Excavating a Tunnel at Montreal for the Canadian Northern Ry. Description of the work. Ills. 3000 w. Engng & Con—Sept. 7, 1913. No. 45228.

Tunneling. Robert B. Sinclair. Describes some methods at present followed. 1500 w. Can Engr—Oct. 2, 1913. No. 45689.

An Example of Difficult Tunneling. J. M. M. Greig. Describes the combined use of shield and compressed air on work in the city of Glasgow, subjected to unusually complex conditions. Ills. 2500 w. Can Engr—Oct. 16, 1913. No. 45953.

The Astoria Tunnel under the East River, New York City. Harold Carpenter. Illustrated description of this tunnel, remarkable for its size, the size of gas mains to be installed, and the unusual difficulties overcome in its construction. 4000 w. Eng News—Oct. 16, 1913. No. 45030.

The Channel Tunnel. Discusses this proposed undertaking giving particulars. Ills. 2500 w. Engr Lond—Oct. 3, 1913. No. 45864 A.

The Mont D'Or Tunnel. An account of the difficulties encountered in the construction of the Frasné-Vallorbe line in France, and brief review of its history. Map & profile. 1300 w. Engr, Lond—Oct. 10, 1913. No. 45989 A.

See also English Channel, under *Bridges*; Subways, under *STREET AND ELECTRIC RAILWAYS*; Roadway and Tunnels, under *RAILWAY ENGINEERING, Permanent Way and Buildings*.

Underpinning

Underpinning the Cross Building, Fifth Avenue, New York. Illustrates and describes difficult underpinning made necessary in constructing an adjoining 20-story building. 1500 w. Eng News—Dec. 19, 1912. No. 38331.

Vaults

Bank Vault of the Guaranty Trust Company of New York City. Describes the construction of a vault believed to be burglar proof and fireproof. Ills. 2500 w. Eng News—Aug. 7, 1913. No. 44252.

Waterproofing

Preventing Dampness in Masonry. An

Windbracing

MATERIALS OF CONSTRUCTION

Cement

account of a method recently developed by Achille Knapen, a Belgian engineer. 1000 w. Eng Rec—Jan. 18, 1913. No. 39194.

Waterproofing of Concrete. Slightly condensed report of the committee on waterproofing materials of the Am. Soc. for Testing Materials. 2000 w. Eng Rec—July 12, 1913. No. 43666.

The Cause and Prevention of Dampness in Buildings. George Matson. Directions for the construction of a damp-proof course when building and suggestions for overcoming other causes of dampness. 4000 w. Builder—Oct. 10, 1913. No. 45965 A.

See Cement, under *Materials of Construction*.

Wind Bracing

Windbracing Without Diagonals for Steel-Frame Office-Buildings. R. Fleming. Gives three methods in use of calculating wind stresses and movements in

office-buildings where diagonals are not permissible. 8500 w. Eng News—March 13, 1913. No. 40653.

The Resistance of Steel-Framed Sheds to Wind Forces. Albert S. Spencer. Gives data used by the writer for sheds and similar structures. Ills. 4000 w. Engr, Lond—May 30, 1913. Serial. 1st part. No. 42786 A.

Woolworth Building

Design of the Woolworth Building. S. F. Holtzman. Considers features of sub-structure and calculations for wind bracing of tower. Ills. 3000 w. Eng Rec—July 5, 1913. No. 43471.

The Woolworth Building. Cass Gilbert. Illustrated detailed description, 3000 w. Archt & Build—July, 1913. No. 43773 C.

See also same heading, under *ELECTRICAL ENGINEERING, Power Applications*.

MATERIALS OF CONSTRUCTION

Asphalt

Asphalt Still a Mysterious Material. Newton Forest. Information concerning deposits and their quality, use and history. 1200 w. Sci Am—Nov. 30, 1912. No. 87974.

Asphalt Plants

Investigation of Municipal Asphalt Plants. Gives cost data collected in report by D. E. McComb, recommending plant for Washington, D. C. 4000 w. Eng Rec—Feb. 8, 1913. No. 39729.

Brick

Consistent Brickwork. George J. Jervis. Discusses artistic brickwork and the position of the architect and the manufacturer. Ills. 2000 w. Am Archt—Nov. 6, 1912. Serial. 1st part. No. 37302 C.

Some Thoughts on the Development of the Sand Lime Brick Industry. P. L. Simpson. Discusses some of the conditions necessary for a successful sand lime brick plant, the processes, etc. Ills. 6000 w. Cement & Engng News—Jan., 1913. No. 39280.

Sand-Lime Brick and Artificial Sand Stones in the Philippines. Alvin J. Cox, W. C. Reibling, and F. D. Reyes. Notes on investigations in progress to ascertain the suitability and relative efficiency of available raw materials for the manufacture of sand-lime bricks. Ills. 10000 w. Philippine Jour of Sci—Oct., 1912. No. 41706 N.

The Disintegration of Brick Walls. James Scott. Illustrated description of some of the minute plants that disfigure brick walls and cause deterioration.

1200 w. Archt, Lond—Sept. 12, 1913. No. 45280 A.

Points in Bricks and Brick Construction. Robert J. Marshall. Discusses the effect of the frog in brickwork, variations in sizes, classification, mortars, and related subjects. 3000 w. Can Engr—Oct. 9, 1913. No. 45787.

See Piers, under *Materials of Construction*, and Brick, under *Roads and Pavements*.

Building Stones

Undeveloped Wealth in the Building Stones of the South. A. T. Coons. Discusses briefly the kinds and importance of the stones produced in the different states. 7500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41560 N.

Cement

The Raw Materials of the Portland Cement Industry. Percy S. Barber. The present number deals with chalk deposits in England. 2500 w. Engr, Lond—Nov. 8, 1912. Serial. 1st part. No. 37644 A.

The Effect of Cement Competition on the Stone Industry. Edwin C. Eckel. Discusses the probable effects on the future development of the stone industry. 3000 w. Eng News—Dec. 5, 1912. No. 38062.

On Long-Time Tests of Portland Cement. I. Hiroi. Presents results of unfinished experiments. 1200 w. Pro Am Soc of Civ Engrs—Dec., 1912. No. 39292 F.

On Long-Time Tests of Portland Cement. Discussion of I. Hiroi's paper.

Consult Classification of the Index. See page 9.

Cement

MATERIALS OF CONSTRUCTION

Cement

1500 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41317 F.

Cement Manufacture. A number of short papers by different authors, with discussions, contributed by the Sub-Committee on Cement Manufacture. 9000 w. Jour Am Soc of Mech Engrs—Feb., 1913. No. 40151 D.

The Constitution of Portland Cement. P. H. Bates. Read before the Nat. Assn. of Cement Users. Discusses the qualitative constitution of the first burns made in the Pittsburgh kiln. 8000 w. Cement & Engng News—Feb., 1913. No. 39929.

Constancy of Volume of Accelerated Tests in Portland Cement. Reviews the discussion at the meeting of the Int. Assn. for Testing Materials. 3000 w. Can Engr—March 20, 1913. No. 40784.

Contributions to the Study of Pozzuolana (Contribuzione allo studio della pozzolana). G. Giorgis and G. Gallo. Additions to results shown by Paolo, Prato-lungo and Bacoli on the action of this hydraulic cement. 3000 w. Il Cemento—Feb. 28, 1913. No. 40615 D.

Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct. Continued discussion of paper by J. B. Lippincott. 3000 w. Pro Am Soc of Civ Engrs—Jan., 1913. No. 39390 F.

Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct. Continued discussion of paper by J. B. Lippincott. 1800 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41318 F.

Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct. Continued discussion of paper by J. B. Lippincott. 3500 w. Pro Am Soc of Engrs—April, 1913. No. 41648 F.

Growth of Cement Industry on Pacific Coast. Charles A. Newhall. Read before the Pacific N. W. Soc. of Engrs. A review of the development of this industry during about 30 years. Ills. 2500 w. Concrete-Cement Age—April, 1913. No. 41253.

Portland Cement Resources and Industry in the Southern States. Ernest F. Burchard. Explains the conditions in the South which favor cement manufacture, and the progress of the industry. Map. 4000 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41559 N.

Tests of Cements and Cement Mortar When Mixed with Oil. H. H. Scofield. Reports tests made in the laboratory of Purdue University. 500 w. Indiana Engng Soc—1912. No. 41739 N.

Action of the Salts in Alkali Water and Sea Water on Cements. P. H. Bates, A. J. Phillips, and Rudolph J. Wig. A re-

port of investigations for the purpose of determining the suitability of various cements in structures exposed to sea water and alkali salts. 157 pp. Tech Papers of Bureau of Stand—No. 12. No. 42926 N.

Blended or Sand-Cement; Results of the Study and Experience of the U. S. Reclamation Service. Rapier R. Coghlan. Information concerning the materials and manufacture, with report of tests. 4000 w. Eng News—June 19, 1913. No. 42982.

Sand Cement. Discusses results obtained by using very fine material as an ingredient in cement reporting tests. 3000 w. Engr, Lond—June 13, 1913. No. 43145 A.

Experiments on the Action of Various Substances on Cement Mortars. Richard K. Meade. Read before the Am. Soc. for Test. Mat. Report of results of experiments. 2000 w. Eng Rec—July 5, 1913. No. 43470.

Fineness of Cement and Rate of Hydration. Henry S. Spackman. (Read before the Am. Soc. for Test. Mat.) Explains the important relation between these qualities. 1200 w. Can Engr—July 24, 1913. No. 43908.

Proposal for Establishing a Standard SO₂ Content for Portland Cement. Read before the Int. Assn. for Test. Mat. Recommendations of the German Portland Cement Mfrs. Assn. to the Int. Assn. for Testing Materials. 2200 w. Chem Engr—July, 1913. No. 43861 C.

Modern Methods in the Manufacture of Portland Cement. H. K. G. Bamber. Notes on a paper before the Vancouver Branch of the Can. Soc. of Civ. Engrs. Considers particularly the processes upon which depends the quality and reliability of the material. 2500 w. Can Engr—June 12, 1913. No. 42857.

Modern Methods in the Manufacture of Portland Cement. H. K. G. Bamber. Part of an address before the Vancouver branch of the Can. Soc. of Civ. Engrs. Describes processes used at Bam-berton, Vancouver Island. 1800 w. Eng News—June 26, 1913. No. 43313.

Autoclave Test for Cement. D. L. & W. R. R. H. J. Force. Read before the Engrs.' Soc. of N-E. Penn. Considers causes of failures of concrete structures and describes the autoclave test required by this railroad, giving results. 4000 w. Ry & Engng Rev—Jan. 18, 1913. No. 39236.

The Autoclave Test for Cement. Discussion before the American Society for

Consult Classification of the Index. See page 9.

Cement Handling

Testing Materials, at Atlantic City, June 26, and a report to the Association of American Portland Cement Manufacturers. 10000 w. Eng Rec—July 5, 1913. No. 43469.

A Bonus System for the Purchase of Portland Cements. W. C. Reibling. Discusses the weakness of cement specifications and the results from tests and proposes a bonus system for superior qualities. 5500 w. Philippine Jour of Sci—April, 1913. No. 44056 N.

Control of Dust in Portland Cement Manufacture by the Cottrell Precipitation Processes. Walter A. Schmidt. Describes the application of the Cottrell electrical precipitation processes to this problem. 2500 w. Cement & Eng News—Aug., 1913. No. 44277.

Practical Possibilities of Securing Superior Cement Quality by Improved Methods of Purchasing. Discusses the disadvantages connected with standard specifications. 1500 w. Engng & Con—Aug. 6, 1913. No. 44208.

Tests of Waterproofing in Cement. Cloyd M. Chapman. Calls attention to features of tests which deserve attention, and precautions necessary to avoid deceptive results. 2200 w. Con Rec—Aug. 6, 1913. No. 44228.

United States Government Specification for Portland Cement. Ills. 8500 w. Bureau of Stand—Circ. No. 33. No. 44737 N.

Cement Materials and the Manufacture of Portland Cement in Montana. W. H. Andrews. The materials are widely scattered throughout the state. Only one cement mill is in operation at present. 2000 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45473 F.

The Manufacture and Uses of Portland Cement. L. M. Bailey. Brief review of the development of the industry, methods of manufacture, and uses. Short discussion. 5500 w. Jour Assn of Engng Socs—Oct., 1913. No. 46150 C.

See also Stresses, under *Measurement*; Dams, under *Water Supply*, and Blast-Furnace Slag, under *Mining and Metallurgy, Iron and Steel*.

Cement Handling

Handling Cement in Bulk. J. H. Liberton. Discusses the efficient handling of this material, reporting a time study, and discussing related matters. Ills. 2000 w. Eng Rec—July 19, 1913. No. 43786.

Cement Mill

The New Cement Mill and Lime Hydrating Plant at Union Bridge, Maryland. Illustrated description of large mills using individual motor drive for the

MATERIALS OF CONSTRUCTION

operating machinery. 3500 w. Cement & Eng News—April, 1913. No. 41255.

Cement Pipes

The Action of Alkali on Cement Pipes. Will L. Brown. Describes conditions found in the upper San Bernardino Valley, Cal. 1500 w. Cement & Eng News—July, 1913. No. 43688.

Cement Plants

Inland Portland Cement Plant at Meteline Falls. Detailed description of a plant in the state of Washington and its construction. Ills. 2000 w. Cement & Eng News—July, 1912. No. 43687.

The Meteline Plant of the Inland Portland Cement Co., Meteline Falls, Wash. Milo W. Krejci. Power development, quarries and manufacturing operations at this plant. Ills. 2600 w. Bul Am Inst Min Engrs—July, 1913. No. 44019 F.

The Santa Cruz Portland Cement Company's Plant, Davenport, California. Llewellyn F. Bachman. Brief illustrated description. 2500 w. Cement & Engng News. March, 1913. No. 40628.

New Cement Plant in Vancouver. Illustrated description of a plant at Bamberton, showing the use of concrete sheet piling and heavy construction at a precipitous site. 2000 w. Eng Rec—Aug. 2, 1913. No. 44124.

The New Cement Plant at Spokane, Washington. E. W. Miller. Illustrated description of the plant and the method of handling raw materials, reducing dust trouble, and gravity loading. 3300 w. Cement & Eng News—Aug., 1912. No. 44275.

Southwestern Portland Cement Works. Charles A. Smith. Illustrated description of the plant and method of operation of works near El Paso, Tex. 2500 w. Eng & Min Jour—Oct. 18, 1913. No. 45935.

Clays

The Physical Properties of Clays. Walter C. Hancock. Brief discussion of the formation, physical properties, and related matters. General discussion. 8500 w. Jour Soc of Arts—April 18, 1913. No. 41745 A.

Concrete

Impermeability Tests on Concrete. James L. Davis. Considers the effect of the inclusion of hydrated lime, puzzolana, and clay, very fine cement, and gives new comparative figures on the variation of the mixture with the pressure, on leakage through concrete. 3500 w. Eng News—Nov. 7, 1912. No. 37320.

Waterproof Concrete. Albert Grittnner. Abstract of address before the Int. Soc.

Concrete

Concrete

MATERIALS OF CONSTRUCTION

Concrete

for Test. Mat. Reports results of experiments, especially with potash soap. 1500 w. Cement & Engng News—Nov., 1912. No. 37378.

Coefficient of Sliding Friction of Concrete on Concrete. Frank P. McKibben. Brief summary of experimental work at the Fritz Laboratory. 1500 w. Eng Rec—Dec. 28, 1912. No. 38581.

A Study of the Disintegration of Concrete in Sewage Tanks Caused by Excessive Hydrogen Sulfid. Bacterial Activity in the Disintegration. From Bul. 26, Engng. Ex. Station of Iowa State College, prepared by William M. Barr and R. E. Buchanan. Discusses the production of excessive hydrogen sulfid in sewage disposal plants and the consequent disintegration. Engng & Con—Nov. 27, 1912. No. 37923.

Color and Texture of Concrete Products. Adolph Schilling. Illustrated discussion of surface treatment, coloring by immersion, and stone dressing methods applied to concrete. 2000 w. Concrete-Cement Age—Jan., 1913. No. 39216.

Action of Acids, Oils and Fats Upon Concrete. W. Laurence Gadd. Abstract of a paper read before the Concrete Inst. Gives conclusions based on experimental data. 2000 w. Archt, Lond—Jan. 3, 1913. No. 39132 A.

Influence of Temperature on Concrete. Warren A. Hoyt. Gives a proposed method of figuring the increase in strength under cold weather conditions. 3000 w. Eng Rec—Jan. 18, 1913. No. 39188.

Experiments on the Adhesion of Old and New Concrete. Hector St. George Robinson. Reports a series of experiments to determine the relative efficiency of various methods of jointing concrete. 1000 w. Inst of Civ Engrs—No. 3999. No. 39293 N.

Variations in the Volume of Concrete, and the Strains Induced Thereby in Structures (Volumenänderungen des Betons und dabei auftretende Anstrengungen in Beton- und Eisenbetonkörpern). Otto Graf. Studies extending over several years. Curves. 1700 w. Zeit des Ver deutscher Ing—Dec. 21, 1912. No. 39042 D.

The Development of Unit Structural Concrete. Charles D. Watson. Explains the present development of this system, its advantages, etc., illustrating and describing structures. 3000 w. Pro Engrs' Club of Phila—Jan., 1913. No. 39960 D.

The Settlement of Solids in Water and Its Bearing on Concrete Work. Dr. J. S. Owens. Extracts from a paper read before the Concrete Inst. considers the more important factors governing the grading of stones and shingle, sand and mud.

3000 w. Surveyor—Feb. 7, 1913. No. 39910 A.

Some Experiments with Mortars and Concretes Mixed with Asphaltic Oils. Arthur Taylor and Thomas Sanborn. Describes experimental tests made and states conclusions. 2200 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41311 F.

Some Tests of the Waterproofing Properties of Oil-Mixed Portland Cement Concrete. Logan Waller Page. Explains the process of mixing oil with Portland cement concretes and hydraulic cements, reporting tests. 3500 w. Indiana Engng Soc—1912. No. 41738 N.

A Discussion of the Economics of Practical Concrete Construction. De Witt V. Moore. A study of concrete construction, with particular regard for costs and efficient methods. 4000 w. Indiana Engng Soc—1912. No. 41744 N.

Tests to Determine the Effect of Stone Dust in the Concrete Aggregate. Francis Dawson. Gives results and describes tests. 1800 w. Cornell Civ Engr—April, 1913. No. 41290 C.

Comparative Tests of Slag and Stone Concrete. Brief Synopsis of results of a series of experimental comparative tests. Ills. 700 w. Cornell Civ Engr—April, 1913. No. 41292 C.

The Limitations of Concrete Under Tension (Die Begrenzung der Betonzugspannungen). K. W. Schaechterle. Mathematical discussion aiming at uniform regulation in reinforced concrete construction. Ills. Serial. 1st part. 5800 w. Beton u Eisen—April 1, 1913. No. 41430 E.

Some Thermal Properties of Concrete. Charles L. Norton. Discusses results of research work in progress at the Mass. Inst. of Tech. to study the physical properties of concrete which affect its value as a fire resistant material. 3000 w. Jour Am. Soc of Mech Engrs—June, 1913. No. 42959 D.

Some Recent Applications of Concrete in Railroad Work. Frederick Auryanzen. Read before the Nat. Assn. of Cement Users. Presents the advantages of this material for railroad structures, illustrating applications. 4000 w. Cement—Aug., 1913. No. 44522.

The Effect of Saturation on the Strength of Concrete. J. L. Von Ornum. Shows the importance of specifying and standardizing the moisture treatment of test specimens and considering the conditions that may affect the strength of the finished structure. 2000 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44784 F.

Consult Classification of the Index. See page 9.

Concrete Blocks

MATERIALS OF CONSTRUCTION

Lime

Notes on the Economies of Gravel Screening for Concrete. George A. Merrill. Discusses case illustrating how to determine the proportions of unscreened material and screened gravel to use. 1500 w. *Engng & Con*—Oct. 15, 1913. No. 45889.

The Effect of Salts Upon the Strength of Concrete Cured at Low and Normal Temperatures. H. E. Pulver. A report of tests made to determine the effect of sodium chloride and calcium chloride, separately and together. 1200 w. *Wis Engr*—Oct., 1913. No. 46311 C.

See also Concrete, under *Bridges*; Concrete, under *Construction*; Sewers, under *Municipal*; Electrolysis, under *ELECTRICAL ENGINEERING, Electro-Chemistry*.

Concrete Blocks

How to Produce Realistic Stone Facings. Charles H. Doubler. Suggestions for the making of artistic concrete blocks. Ills. 2500 w. *Concrete-Cement Age*—Dec., 1912. No. 38152.

Concrete Piles

Concrete Piles and Concrete Piling Equipment Maxwell M. Upson. Remarks on the applications of reinforced concrete and illustrated detailed description of concrete piling and its advantages. 5500 w. *Cement & Engng News*—Dec., 1912. No. 38200.

Foundation Piles (I pali per fondazione). Types of reinforced concrete piling, describing especially the "Conus" type. Ills. Serial. 1st part. 2000 w. *Il Cemento*—Nov. 15, 1912. No. 38497 D.

Concrete Plant

A Successful Concrete Products Plant in Rochester. Illustrated description of layout, equipment and methods. 1800 w. *Concrete-Cement Age*—Dec., 1912. No. 38153.

See also Timber Preservation, under *Construction*; and Ties, under *Railway Engineering, Permanent Way and Buildings*.

Creosote

The Production and Supply of Coal Tar Creosote. E. A. Sterling. A discussion of the question of creosote supply and its importance in the road preserving industry. General discussion. 4000 w. *Am Wood Pres Assn*—Jan., 1913. No. 43264 N.

Notes on Analysis and Testing of Coal Tar Creosote. L. B. Shipley. A résumé of some of the work carried out in the Research Laboratories of the Barrett Mfg. Co. General discussion. 5000 w. *Am Wood Pres Assn*—July, 1913. No. 43266 N.

Some Experimental Treatments, with Reference to the Effect of Initial Air

Pressure on Penetration of Creosote. R. Belcher. Gives results of six experimental runs with and without initial air pressure. Ills. Discussion. 5000 w. *Am Wood Pres Assn*—Jan., 1913. No. 43267 N.

Drain Tile

See Specifications, under *Materials of Construction*.

Fireproof

"Eternit," a New Material for Roofs, Walls and Floors ("Eternit," ein neues Material zur Bedachung und Bekleidung von Wänden und Decken). Describes patented tile composed of cement and asbestos. Ills. 2000 w. *Glaser's Ann*—Nov. 1, 1912. No. 38430 D.

Forest Products

Lumber, Lath and Shingles, 1911. Information based on reports from 28107 sawmills. 45 pp. Bureau of Census—May 12, 1913. No. 44052 N.

Crossties Purchased, 1911. Statistics of crossties by steam and electric roads of the United States. 2000 w. Bureau of Census—May 12, 1913. No. 44053 N.

Poles Purchased, 1911. Statistics showing number of wooden poles bought in the U. S. 1911 by railroads, electric light and power companies and telegraph and telephone companies. 2000 w. Bureau of Census—June 18, 1913. No. 44054 N.

Gravel

A Gravel Screening and Washing Plant. Illustrated description of a plant in Vancouver, of interest from the standpoint of economical layout. 1000 w. *Can Engr*—Jan. 9, 1913. No. 38962.

Stone Crushing and Screening, Fairmount, Ill. K. E. Casparis. Illustrates and describes a plant which produces stone for blast-furnace and cement-mills. Use exclusively. 2000 w. *Eng News*—Jan. 16, 1913. No. 39198.

See also Panama Canal, under *Waterways and Harbors*.

Lath

The Lièvre Reinforced Lath (Lattis armé Lièvre). Hector Lièvre. Rolls of triangular lathing, wired together for simple and expeditious use in attaching to wood or metal joists. Ills. 2000 w. *Bul Soc. d'Encour*—Dec., 1912. No. 40063 E + F.

Lime

Contribution to the Knowledge of Plasters From a Technical View-Point (Contributo alla conoscenza del gesso dal punto di vista tecnico). G. Gallo. A study of lime formation, lime deposits, plaster making, etc. Ills. Serial. 1st part. 4500 w. *Il Cemento*—Dec. 15, 1912. No. 39092 D.

Consult Classification of the Index. See page 9.

Lumber

Lumber

See Forest Products, under *Materials of Construction*.

Metallic Coatings

Recent Advances in the Spray Process for the Production of Metallic Coatings. M. U. Schoop. Illustrates and describes the latest development of this process. 2200 w. Met & Chem Engrg—Feb., 1913. No. 39685 C.

Recent Progress in Painters' Materials, with Special Reference to Hygienic Paints. Arthur Seymour Jennings. Read before the Edinburgh Archt. Assn. An account of improvements in materials. 4000 w. Archt, Lond—March 7, 1913. No. 40697 A.

The Use of White Lead in Painting. Noel Heaton. Gives reasons for thinking that it is indispensable to the painter. 12500 w. Jour Soc of Arts—March 14, 1913. No. 40799 A.

The Preservative of Metals Used in Marine Construction. Frank Lyon. A discussion on corrosion, the use of paints, and other methods of protection. 4500 w. Soc of Nav Archts & Marine Engrs, No. 7—Nov. 21, 1912. No. 37690 N.

Soya-Bean Oil as a substitute for Linseed Oil in Paints. Maximilian Toch. Read before the Soc. of Chem. Ind. Information concerning this oil and its use. 1500 w. Eng News—Nov. 28, 1912. No. 37943.

Notes on the Testing of Anti-Corrosion Paints. P. Laborde and F. Austett. Read before the Int. Assn. for Test. Mat. A report of research work. 4000 w. Chem Engr—Jan., 1913. No. 39496 C.

Notes on the Formation and Inhibition of Mildew in Paints. Henry A. Gardner. Describes this peculiar condition, its cause and remedy. Ills. 1200 w. Jour Fr Inst—Jan., 1913. No. 39357 D.

Paint Estimates

Estimating Amount of Red Lead Paint for Steel Work. Cloyd M. Chapman. Gives tables for estimating the area of surface and method of obtaining a reasonably close estimate. 1500 w. Eng. Rec—Feb. 15, 1913. No. 39866.

Paints

Selecting and Specifying Protective Coats for Iron and Steel. J. Cruickshank Smith. Discusses the paint, the surface, and the formation of the film, and some methods of testing paints. 3000 w. Engineering Magazine—Dec., 1912. No. 37788 B.

Paints for Metallic Structures. Allerton S. Cushman. Official report to the Int. Assn. for Test. Mat. Reports methods of testing and results. 4000 w. Chem Engr—Jan., 1913. No. 39497 C.

MATERIALS OF CONSTRUCTION

Reinforced Concrete

Paint for Standpipes and Methods of Applying. A topical discussion. 2500 w. Jour N Eng W-Wks Assn—Dec., 1912. No. 39532 F.

The Painting of Iron and Steel. Discusses the principles that must be observed, in our present state of knowledge, to obtain the best results from paint coatings for preservation purposes. 3500 w. Engr, Lond—Feb. 28, 1913. Serial, 1st part. No. 40491 A.

The Protection of Steel from Corrosion. Henry Williams. Presents critical problems in the preservation of modern structures. Ills. 4000 w. Engineering Magazine—May, 1913. No. 41629 B.

Paint for Ironwork. G. Basil Barham. Discusses the requirements and past and present practice. 2000 w. Surveyor—April 25, 1913. No. 41921 A.

A Test of Red-Lead Priming Paints. Cloyd M. Chapman. Gives results of an extended series of tests of both ready-mixed and straight red-lead paints. 2500 w. Eng News—May 8, 1913. No. 41942.

A Practical Test of Metal-Protective Paints. Louis H. McFadden. Report of test made on a Pennsylvania R. R. bridge across the Susquehanna River, and on prepared steel plates. 2000 w. Eng Rec—June 14, 1913. No. 42825.

Powerful Influence of Basic Pigments in Protecting Metals from Corrosion. Henry A. Gardner. Discusses factors affecting inhibitive value, results of tests, etc. Ills. 3500 w. Eng Rec—July 26, 1913. No. 43932.

The Preservation of Metal Structures (Sulla conservazione delle strutture metalliche). Bruto Laurenti. The present status of paint preservatives and the protective qualities to be desired. 2500 w. Ingeg Ferroviaria—July 15, 1913. No. 45371 D.

See also White Lead, under *Materials of Construction*.

Piers

Tests of Two Brick Piers of Unusual Size. James E. Howard. Read before the Nat. Brick Mfrs.' Assn. Report of tests made at the Pittsburgh laboratory, with results. Ills. 2000 w. Eng Rec—March 22, 1913. No. 40769.

Piling

See also Concrete Piles, under *Materials of Construction*.

Reinforced Concrete

Test Deflections in Reinforced Concrete. Percy J. Waldram. Calls attention to the want of intrinsic strength of individual members of reinforced concrete structures, reporting results of tests. 3300 w. Soc of Engrs—Dec. 2, 1912. No. 38672 N.

Consult Classification of the Index. See page 9.

Reinforced Concrete MATERIALS OF CONSTRUCTION Reinforced Concrete Beams

Remarks Concerning the Effect of Sea-Water on Reinforced Concrete. M. de Muralt. States results of experiments in Europe, and conclusions reached. 1800 w. Cement—Sept., 1912. No. 38340 C.

Progress Report of Special Committee on Concrete and Reinforced Concrete. An account of the appointment and work of the committee, historical sketch of use of concrete and reinforced concrete, its adaptability, materials, etc. 20000 w. Pro Am Soc of Civ Engrs—Feb., 1913. No. 40167 F.

Reinforced Concrete in Churches. V. J. Elmont. General remarks on the use of this material, with illustrations and descriptions of various applications to church architecture. 1800 w. Can Engr—Feb. 20, 1913. No. 39970.

Economy in Reinforced Concrete. John A. Davenport. Abstract of paper read before the Concrete Inst. Discussing economy in reinforced concrete slab, beam, and column construction. 2000 w. Archt, Lond—March 14, 1913. No. 40798 A.

Thaddeus Hyatt, an Early American Investigator and User of Reinforced Concrete. Charles M. Spofford. A brief description of the work of one of the earliest users of reinforced concrete. 2000 w. Jour Assn of Engng Socs—May, 1913. No. 42440 C.

Reinforced Concrete. Percy J. Waldram. Read before the Surveyors' Inst. Discusses its advantages and disadvantages, its uses and limitations. 3000 w. Archt, Lond—April 18, 1913. Serial. 1st part. No. 41746 A.

The New London County Council Regulations for Reinforced Concrete. Percy J. Waldram. Considers the effect upon design in reinforced concrete of alterations in the modular ratio. 3500 w. Engng—Sept. 26, 1913. No. 45739 A.

The Revised L. C. C. Reinforced Concrete Regulations. Ewart S. Andrews. Points out where the regulations and further amendment. 2000 w. Engr, Lond—Oct. 3, 1913. No. 45870 A.

Poles, Piles and Pipe Made without Molds. R. M. Jones. Illustrated description of a method of making reinforced-concrete products. 2200 w. Cement Era—Oct, 1913. No. 45877.

The Influence of Electricity on Reinforced-Concrete (Influence de l'électricité sur béton armé). G. Marlier. Results of extensive tests under varying degrees of age and mixtures. Ills. 7800 w. Tech Mod—July 1, 1913. No. 43582 D.

See also Reinforced Concrete under *Bridges*; Reinforced Concrete, under *Construction*; Reservoirs, under *Water*

Supply, and Reinforced Concrete, under *MARINE AND NAVAL ENGINEERING*.

Reinforced Concrete Beams

Safely Compounded Reinforced Concrete Beams (Ausbildung verbundstärker Eisenbetonbalken). E. Elwitz. A study on the proper reinforcing for beams and slabs. Ills. 3600 w. Beton u Eisen—Oct. 2, 1912. No. 37427 E.

The Determination of the Most Economical Dimension for Reinforced-Concrete Beams in the Form of Slabs (Sur la détermination des dimensions les plus économiques des poutres en béton armé formant plaques). Arthur Leipold. Mathematical. Diagrams. 3300 w. All Indus—Oct., 1912. No. 37526 D.

The Value of Experiment Determinations on Concrete and Reinforced-Concrete Beams (Auswertung der Ergebnisse von Versuchen mit Beton- und Eisenbetonsäulen). Joseph A. Spitzer. Tables and charts giving results of experimental research. Serial. 1st part. 4500 w. Beton u Eisen—Nov. 27, 1912. No. 38428 E.

A Time Saving Chart for Solving Problems in Reinforced-Concrete Beam Design. Donald P. Maxwell. Gives chart and illustrates its use by examples. 1000 w. Engng & Con—Jan. 1, 1913. No. 38773.

Method of Computing Reinforced Concrete T-Beams. Gunder Hansen. Gives a short method for computing when the neutral axis is in the web. 300 w. Eng Rec—Jan. 25, 1913. No. 39369.

Shearing Strength of Construction Joints in Stems of Reinforced Concrete T-beams, as Shown by Tests. Lewis J. Johnson and John R. Nichols. A record of tests which seem to show results at variance with previous ideas. Ills. 4500 w. Pro Am Soc of Civ Engrs—Feb., 1913. No. 40169 F.

Some Short-Cuts in Reinforced-Concrete Beam Design. M. J. Sorente. Gives methods the writer has found convenient. 2000 w. Eng News—March 20, 1913. No. 40740.

Notes on the Calculation of Reinforced Concrete Beams (Note sur le calcul des poutres en béton armé). M. Tessier. Explanation of a graphical process for making calculations on simply flexed beams. Diagrams. 30 pp. Ann des Ponts et Chaussées—March, 1913. No. 42183 E + F.

Bending Moments in Continuous Reinforced Concrete Beams. Sanford E. Thompson. Explains the action in reinforced concrete beams, deriving bending-moment-formulæ. 2500 w. Eng Rec—June 7, 1913. No. 42715.

Consult Classification of the Index. See page 9.

Reinforced Concrete Beams MATERIALS OF CONSTRUCTION**Structural Meta**

Tension Conditions in Reinforced Concrete Beams Resulting from Shearing Strains Due to Transverse Forces (Ueber den Spannungszustand im Eisenbetonbalken infolge Beanspruchung durch eine Querkraft). J. Lahrs. A mathematical discussion of the conditions. Diagrams. 3600 w. Beton u Eisen—May 26, 1913. No. 43022 E.

Have Stirrups in a Reinforced Concrete Beam Any Definite Value? Edward Godfrey. Shows that stirrups are still used and sanctioned and discusses their value, explaining a much better method. 2000 w. Engng & Con—Aug. 6, 1913. No. 44211.

Shearing Strength of Construction Joints in Stems of Reinforced-Concrete T-Beams, as Shown by Tests. Continued discussion of Alexis Saubrey's paper. 1200 w. Pro Am Soc of Civ Engrs—Sept., 1913. No. 45524 F.

A Discussion of the Principles of Design of Reinforced Concrete Beams with Special Reference to Internal Stresses, Bond and Shear. J. W. Pearl. A discussion of good design. 9000 w. Engng & Con—Oct. 15, 1913. No. 45888.

See also Floors, under Construction.

Reinforced-Concrete Columns

The Reinforced Concrete Column. Carl Gayler. Critical review of the opinions of investigations, and formulae used. From the "hooped column." Ills. 3000 w. Jour Assn of Engng Socs—Dec., 1912. No. 38651 C.

Reinforced-Concrete Columns. Peter Gillespie. From the Jour. of the Regina Engng Soc. Considers the restrictions too severe; examines tests made on hooped concrete columns and states inferences. Ills. 2500 w. Con Rec—July 2, 1913. No. 43454.

Results of Some German Tests of Concrete Columns Reinforced with Cast Iron and Spiral Reinforcement. Abstract of an article by Dr. F. von Emperger. Ills. 1200 w. Engng & Con—Aug. 6, 1913. No. 44213.

Reinforced-Concrete Slabs

Calculations on Cross-Bound Reinforced-Concrete Slabs and Their Bearing Capacity (Die Berechnung der gekreuzbewehrten Eisenbetonplatten und deren Aufnahmeträger). Hugo v. Bronneck. The development of formulae for rectangular and triangular systems of reinforcing. Ills. 2600 w. Beton u Eisen—Jan. 20, 1913. No. 40033 E.

A Comparative Test of Two Full-Sized Reinforced-Concrete Flat-Slab Panels. Henry T. Eddy. Describes a comparative test of a Norcross slab and a Turner

"mushroom" slab. Ills. 4000 w. Eng News—March 27, 1913. No. 40940.

Tests of Reinforced Concrete Slabs Under Concentrated Loading. Abstract of paper, and discussion, on the determination of the effective width of concrete slabs, presented before the Am. Soc. for Test Materials. 3000 w. Eng Rec—Aug. 9, 1913. No. 44240.

Adaptability of Flat Slab Construction to Warehouses and Shops. A. M. Wolf. Illustrated article discussing the advantages of the type. 1500 w. Ry Engng & Main of Way—Oct., 1913. No. 45898.

Reinforcing

Further Tests on Cast Iron Reinforcing (Weitere Versuche mit umschürnten Gusseisen). Fr. von Emperger. Results with tests on certain sections not covered by previous tests made by the author. Ills. 7500 w. Beton u Eisen—Jan. 20, 1913. No. 40032 E.

Reinforcing Steel for Concrete. Olney J. Dean. Gives facts concerning different kinds of steel used for reinforcing and shows the properties of the materials. 4000 w. Indiana Engng Soc—1912. No. 41737 N.

Rerolled Steel Rail Reinforcing Bars. W. K. Hatt. Abstract of papers read before the Am. Soc. for Test. Mat. A comprehensive investigation into the quality of this steel as a reinforcing material. 1500 w. Concrete-Cement Age—July, 1913. No. 43732.

Sand Washing

Sand and Gravel Washing Plants. Raymond W. Dull. Read before the Nat. Assn. of Cement Users. Drawings and description of a plant at Peoria, Ill. 1200 w. Cement & Eng News—July, 1913. No. 43689.

Specifications

Specifications for Drain Tile and Sewer Pipe. Gives the committee report of Iowa State Drainage Assn., adopted Feb. 19, 1913. 3000 w. Eng Rec—March 1, 1913. No. 40262.

Purchasing Specifications. A discussion of questions relating to the purchase of materials. 10000 w. Pro Engrs' Soc of W Penn—May, 1913. No. 42917 D.

Steel

Load Tests on an Iron Three-Way Beam Having Three Supports (Belastungs-Versuch mit einem eisernen dreien-digen Träger auf drei Stützen). Richard Sonntag. Special tests for this type of beam. Ills. 1000 w. Glaser's Ann—Nov. 1, 1912. No. 38429 D.

Structural Metal

Metals for Structures. A. T. Wolmisley. Read before the British Assn.

Consult Classification of the Index. See page 9.

Tan Bark

Discusses the uses to which metals are applied, the methods of protecting from corrosion, treatment, alloys, and related matters. 4500 w. Archt, Lond—Sept. 26, 1913. No. 45722 A.

Tan Bark

Harvesting Tan Bark. Samuel J. Record. Information concerning the sources and value of tanning materials. Ills. 2000 w. Sci Am Sup—June 25, 1913. No. 43203.

Tar

Distillation of Tar: Methods of Determination and Value in Specifications. Philip P. Sharples. Read before the Am. Assn. for the Adv. of Sci. Shows the variations in methods of distilling and results, and the need for standardization. 3000 w. Engng & Con—Jan. 8, 1913. No. 38934.

Terra-Cotta

A History of Architectural Terra-Cotta. Harry Lee King. First of a series of articles describing the progressive manufacturing stages. Ills. 700 w. Archt & Bldg—May, 1913. Serial. 1st part. No. 42903 C.

A History of Architectural Terra-Cotta. Harry Lee King. An illustrated description of the methods of manufacture. 2000 w. Archt & Build—July, 1913. No. 43774 C.

Timber

Application of Extensive Timber Tests to Design and Grading. Summary of an analysis of all tests on structural timbers made by the U. S. Forest Service during a period of nine years. 3000 w. Eng Rec—Nov. 23, 1912. No. 37759.

Mechanical Properties of Redwood. A. L. Heim. Gives results of a series of tests made at laboratories of the U. S. Forest Service. Ills. 6500 w. U S Dept of Agri, Circ. 193—Nov. 1, 1912. No. 37676 N.

Tests of Long-Leaf Pine Bridge Timbers. H. B. MacFarland. Tests made to investigate the effect of the full-cell creosote treatment. Ills. 184 pp. Bul Am Ry Engng Assn—Sept., 1912. No. 37679 E.

The Properties of New South Wales Hardwood Timbers. Gives results of timber tests conducted under the auspices of the N. S. W. Government. 5000 w. Builder—Nov. 1, 1912. No. 37384 A.

The Hardwood Timbers of New South Wales, Australia. W. H. Warren. Information concerning the strength, elasticity, and other properties, with results of tests. Ills. 4500 w. Jour Soc of Arts—Dec. 6, 1912. No. 38223 A.

Principles of Drying Lumber at Atmospheric Pressure and Humidity Diagram.

MATERIALS OF CONSTRUCTION

Timber

Harry D. Tiemann. Considers the drying process and its basic principles as determined by Forest Service experiments. 3500 w. U S Dept of Agri—Bul. 104. No. 39509 N.

Messrs. J. Sadd & Sons' Timber Mills at Maldon, Essex. Illustrated description of works laid out on modern lines and equipped with modern machinery, power driven. 2500 w. Elec Rev. Lond—Dec. 27, 1912. No. 38864 A.

Dry Rot in Timber Used in Slow-Burning Construction. Frederick J. Hoxie. Abstract of a paper presented at the Boston meeting, with short discussion. 2500 w. Jour Am Soc of Mech Engrs—March, 1913. No. 40437 D.

Mechanical Properties of Western Larch. O. P. M. Goss. Gives results of a series of tests made to determine the mechanical and physical properties of western larch, and describes the uses of the wood. Ills. 8500 w. U S Dept of Agri, Bul 122—Jan. 27, 1913. No. 40426 N.

Mechanical Properties of Western Hemlock. O. P. M. Goss. Gives results of mechanical tests made by the Forest Service upon western hemlock, and shows the uses to which it is best adapted. Ills. 9500 w. U S Dept of Agri, Bul 115—Jan. 18, 1913. No. 40425 N.

The Development of Research Work in Timber and Forest Products. E. Russell Burdon. Mainly an account of research work in the United States and the advisability of organizing a similar work in Great Britain. Discussion. 8000 w. Jour Soc of Arts—March 7, 1913. No. 40633 A.

Timber Resources of the South. Hu. Maxwell. Information concerning the annual supply of lumber and its value, and subjects relating to the industry. 4500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41554 N.

The Appalachian National Forest as Affecting the South's Future. John H. Finney. Discusses the importance of the Weeks Forestry Bill, signed by Pres. Taft, March 1, 1911, and its value to the Appalachian region. Ills. 3500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41558 N.

A Modern Timber Drying Plant. Describes a "triple duct" drying kiln near London and the control system. Ills. 1200 w. Engr, Lond—June 6, 1913. No. 42893 A.

Dry Rot. Percy Groom. An explanation of the cause as due to fungal attack. 2500 w. Builder—May 30, 1913. Serial. 1st part. No. 42737 A.

Bending Strength of Yellow-Pine Timber. J. J. Morgan. Diagrams and tables

Timber Preservation

MATERIALS OF CONSTRUCTION

Timber Preservation

giving safe loads for beams and girders of standard dimensions. 1500 w. Eng Rec—May 31, 1913. No. 42645.

The Timber Lands of Panama. Forbes Lindsay. Information concerning the quantities, qualities, lumbering, etc. Ills. 3000 w. Wood Craft—June, 1913. No. 42614.

Tests of Creosoted Timber. W. B. Gregory. Reports tests to destruction of beams which had been in use more than 29 years, taken from a trestle near New Orleans. Ills. 1500 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42906 F.

Sap in Relation to the Properties of Wood. Samuel J. Record. Corrects some false ideas in regard to sap, explains what it is and its movement, and related matters. Discussion. 4500 w. Am Wood Pres Assn—Jan., 1913. No. 43272 N.

Comparison Between Quarter and Rift-Sawed Lumber. Extracts from a discussion of the technical purposes of the terms, describing methods. Ills. 1500 w. Wood Craft—June, 1913. No. 42615.

The Bending Strength of Wood (Buigraastheid van hout). M. E. H. Tjaden. Results of a series of tests on fir and oak. Ills. 3300 w. De Ingenieur—May 31, 1913. No. 43053 D.

Timber Preservation

Depth of Penetration in Timber Treatment. A letter from J. A. Lounsbury, with editorial discussion. 3000 w. Ry & Engng Rev—Nov. 9, 1912. No. 37377.

New Creosoting Plant Near Winnipeg. Illustrated description of a plant of the Canadian Pacific Ry. for treating timber for ties. 1000 w. Ry Age Gaz—Nov. 15, 1912. No. 37605.

Progress in the Knowledge of Impregnation (Fortschritte auf dem Gebiete der Imprägnierungstechnik). E. F. Petritsch. An outline of recent developments in timber preservation treatment and testing methods. Ills. Serial. 1st part. 4500 w. Elektrotech u Maschinenbau—Nov. 3, 1912. No. 38463 D.

American Wood Preservers' Convention. Abstracts of papers presented at the Chicago meeting, with résumé of discussions. 19000 w. Ry Age Gaz—Jan. 24, 1913. No. 39405.

Enlarging the Galesburg Tie Plant. Plans and illustrated description of the plant and extensions. 4000 w. Ry Engng & Main of Way—Jan., 1913. No. 39277.

Is the Impregnation of Timber for Marine Construction Economical? (Ist der Imprägnierung der Wasserbauhölzer Wirtschaftlich?) Herr Troschel. Discusses

the value of preservatives in a defense against the teredo. Ills. 1600 w. Gläser's Ann—Jan. 15, 1913. No. 40048 D.

Baltimore and Ohio Timber-Treating Plant. F. J. Angier. Illustrates and describes the layout at Green Spring, W. Va., introducing combination pressure, measuring and drain tanks. 2200 w. Eng Rec—May 24, 1913. No. 42375.

History of Wood Preservation. W. F. Goltra. A summary of the development of the industry. 11000 w. Am Wood Pres Assn—Jan., 1913. No. 43273 N.

Some Tests to Determine the Effect Upon Absorption and Penetration of Mixing Tar with Creosote. F. M. Bond. Describes experiments and results. Discussion. Ills. 12000 w. Am Wood Pres Assn—Jan., 1913. No. 43275 N.

The Requirements for Successful Timber Treatment. Hermann von Schrenk. Considers the essentials of successful treatment. Discussion. 3500 w. Am Wood Pres Assn—Jan., 1913. No. 43268 N.

The Preliminary Treatment of Timber to Insure a More Even and Satisfactory Impregnation with Creosote. David Al-lerton. Brief paper on the importance of seasoning, introducing a discussion. 1200 w. Am Wood Pres Assn—Jan., 1913. No. 43269 N.

Preservation of Lumber for Car Construction. J. H. Waterman. Short paper introducing discussion. 2000 w. Am Wood Pres Assn—Jan., 1913. No. 43271 N.

Natural and Artificial Seasoning of Douglas Fir for Treatments. F. D. Beal. Describes processes tried. Also The Treatment of Douglas Fir with Creosote Oil. G. A. Coleman. 2500 w. Am Wood Press Assn—Jan., 1913. No. 43278 N.

New Treating Plant at Green Springs, Virginia. F. J. Angier. Illustrated description of the plant. A notable feature is the absence of preservative pressure pumps. 2000 w. Ry Engng & Main of Way—June, 1913. No. 42974.

The Development and Status of the Wood Preserving Industry. E. A. Sterling. Read before the Int. Cong. of Ap. Chem. Illustrated account of American practice. 5500 w. Sci Am Sup—July 12, 1913. No. 43496.

The Influence of the Wood Fiber on the Impregnation of Poles (Einfluss des Holz-materials auf die Kyanisierung von Leitungsmasten). Robert Nowotny. Considers the absorptive powers of various woods for telephone poles, etc.

Consult Classification of the Index. See page 9.

Waste Wood

1600 w. Elek a Masch—June 15, 1913. No. 43541 D.

The Powell Saccharine Process for Seasoning and Preserving Timber. R. E. Neele. Describes the Powell process and its application, giving information regarding it. 2000 w. Elec Rev, Lond—Sept. 19, 1913. No. 45556 A.

The Wood Preserving Industry. Considers methods of treating timber with preservatives. 2500 w. Ap Sci—Sept, 1913. No. 46116 C.

See also Timber and Floors, under *Construction*; Poles, under *Electrical Engineering, Transmission*; Creosote, under *Materials of Construction*; Barges, under *Marine and Naval Engineering*; and Ties, under *RAILWAY ENGINEERING, Permanent Way and Buildings*.

Waste Wood

Utilization of Waste Wood. John E. Teeple. Calls attention to the wide variation in character of the raw material and the necessity of applying the treatment best adapted. 2000 w. Met & Chem Engng—Feb., 1913. No. 39681 C.

Chemical Treatment of Waste Wood. H. K. Benson. Read before the Int. Cong. of Ap. Chem. Considers the recovery of values from low grade material. Ills. 2000 w. Sci Am Sup—June 7, 1913. No. 42670.

Waterproofing

Tests of Materials for Waterproof Concrete. Cloyd M. Chapman. Abstract of paper read before the Nat. Cement Users Assn. Reviews tests and methods of testing. 2200 w. Eng Rec—Dec. 21, 1912. No. 38828.

The Causes of Dampness in Building Walls and the New Knapen Process for

MEASUREMENT

Bending Moments

Draining and Drying (Ueber Feuchtigkeiterscheinungen an Bauwerken und das neue Verfahren System Knapen für fachgemässe Trockenlegung und Assanierung). Fritz Willfort. Describes method and principles of special drain tile inserted in walls. Ills. 4200 w. Zeit d Oest Ing u Arch Ver—Nov. 15, 1912. No. 38458 D.

Waterproofing Cement Concrete and Cement Renderings. J. H. Kerner-Greenwood. Read before the Inc. Soc. of Clerks of Work of Gt. Britain. Information concerning Pudlo powder and its uses. 2000 w. Surveyor—July 11, 1913. No. 43896 A.

See also Floors, under *Construction*.

White Lead

Handling White Lead. Illustrated description of a sanitary mechanical system for eliminating dust from operations with dry material. 1000 w. Sci Am Sup—July 19, 1913. No. 43779.

Windows

Sea Shell Window Panes of the Philippines. Brief illustrated description of the decorative effects possible. 1000 w. Met Work—Jan. 17, 1913. No. 39208.

Wood

How to Select Wood for Special Uses. Charles Davis. Discusses the differences in woods and how to make proper use of them. Ills. 1800 w. Wood Craft—Aug., 1913. No. 44195.

Uses of Commercial Woods of the United States. Hu Maxwell. Information concerning beech, birches, and maples. 56 pp. Bul U S Dept of Agri—No. 12. No. 46361 N.

See also Paper Making, under *Mechanical Engineering, Miscellany*.

MEASUREMENT

Arithmetic

Numbering Systems. Raoul Bricard. An explanation of numbering systems, ancient and modern. 2500 w. W. Engng—July, 1913. No. 44045 C.

Beams

Reverse Bending Moments in Fixed Beams. Ewart S. Andrews. Mathematical discussion. 600 w. Engr, Lond—Aug. 22, 1913. No. 44929 A.

Beam Tests

Stanchions Carrying Excentric Loads. Ernest G. Beck. Considers the case where the load is applied at the upper end of the stanchion, within the boundaries of the cross-section. 2500 w. Engr, Lond—April 18, 1913. No. 41775 A.

Bending Experiments with a Strut from the Demolished Hamburg Gasholder (Knickersuche mit einer Strebe des eingestürzten Hamburger Gasbehälters). H.

Rudeloff. Results on a two-channel braced column at the Royal Testing Laboratory in Berlin. Ills. 2700 w. Zeit des Ver deutscher Ing—April 19, 1913. No. 42140 D.

On the Theory of Beams Under Rolling Loads (Zur Theorie des Balkens unter Verkehrslast). Wolfgang Vogt. A study of moments. Diagrams. 2200 w. Zeit des Ver deutscher Ing—April 19, 1913. No. 42141 D.

Bending Moments

The Theorem of Three Moments. J. P. J. Williams. Derives a complete general form of the theorem, applying it to a plate-girder draw span with variable moments of inertia, to find the percentage of error introduced by the use of the usual formula. 4500 w. Pro Am Soc of Civ Engrs—Dec., 1912. No. 39289 F.

Consult Classification of the Index. See page 9.

Bridge Stresses

MEASUREMENT

Leveling

Bridge Stresses

Conditions for Maximum Live-Load Stresses in the Pratt Truss with Curved Top Chord. C. R. Young. Mathematical treatment of the subject. 1500 w. *Ap Sci*—Nov., 1912. No. 38282 C.

Tests of Nickel-Steel Riveted Joints. Summary of conclusions indicated by the recent tests made at the University of Illinois to furnish information for the engineers of the Quebec bridge. 1800 w. *Engng*—Dec. 6, 1912. No. 38242 A.

Cement Testing

The Distribution of Stress at the Minimum Section of a Cement Briquette. E. G. Coker. Read before the Int. Assn. for Test. Mat. Explains an optical method of determining the stress distribution. *Ills.* 1500 w. *Engng*—Dec. 13, 1912. No. 38525 A.

Cement Sieve Specifications. R. Y. Ferner. Concerning the work of the Bureau of Standards on sieve specifications and measurement. *Ills.* 4000 w. *Eng Rec*—Dec. 28, 1912. No. 38580.

Columns

Theory of Taper Columns. W. M. Wallace. Applies Euler's law to columns of varying section. 1800 w. *Engng*—Dec. 20, 1913. No. 38888 A.

Concrete Testing

The Compressive Strength of Concrete and Stone. Ewart S. Andrews. Considers the explanation of the apparent shear failure of concrete and stone blocks in compression; ratio between tensile and compressive strength; application to reinforced concrete columns, and other problems. 1800 w. *Engr*, Lond—Sept. 19, 1913. No. 45571 A.

Drain Tile Tests

Strength of Drain Tile and Sewer Pipe. Gives results of a study of the causes and prevention of pipe failures, with conclusions, based on experiments of loads in trenches. 2000 w. *Eng Rec*—July 12, 1913. No. 43660.

Drawings

The Photostat. Illustrated description of an apparatus which produces photographic copies on paper direct from the pencil drawing. 1500 w. *Engr*, Lond—Dec. 20, 1912. No. 38901 A.

Earth Pressures

Lateral Earth Pressures. Roberts J. Mann. Gives a summary of the more important theories and experiments. *Ills.* 4000 w. *Cornell Civ Engr*—April, 1913. No. 41291 C.

See also Earth Settlement, under MINING AND METALLURGY, *Mining*.

Earthwork

A Slide Rule Method of Computing Earthwork. Frank Helm. Gives the de-

velopment of special formulae and shows application. 800 w. *Engng & Con*—Aug. 27, 1913. No. 44775.

Floor Tests

Report of a Fire Load and Water Test Made Upon Cinder Concrete Terra Cotta and Gypsum Floor Arches. Illustrated report of a test made at the Columbia Fire Testing Station, Greenpoint, Brooklyn, N. Y. 1500 w. *Cement*—Sept, 1913. No. 45686.

Flow

Flow Over Model of Sunol Dam. Joseph N. Le Conte. An account of tests by which the discharge over the main structure was estimated. 2500 w. *Eng Rec*—Aug. 16, 1913. No. 44433.

See also Run-Off, under *Measurement*, and Stream Flow, under *Water Supply*.

Formulas

The Construction and Use of Empiric Formulas. Cyrus T. Brady, Jr. Explains methods of constructing formulas, and applications. 3000 w. *Eng News*—July 24, 1913. No. 43881.

Hydrography

Hydrographic Surveying; Oakland Harbor Development, California. Fred W. Johnson. Describes the method that proved the best and most economical under the existing conditions. *Ills.* 2000 w. *Eng News*—Aug. 21, 1913. No. 44575.

Hysteresis

Elastic Hysteresis. Earl B. Smith. Gives results of a series of tests made to determine whether this elastic-hysteresis effect actually exists and is a measurable quantity. 1500 w. *Eng Rec*—May 17, 1913. No. 42223.

I-Beams

The Strength of I-Beams in Flexure. Herbert F. Moore. A report of experimental work with summary of results. *Ills.* 40 pp. *Bul Univ of Ill*, No. 68—Sept. 1, 1913. No. 46106 N.

Laboratories

The New Engineering Laboratories at University College, Dundee. Plans and illustrated description. 1200 w. *Engr*, Lond—Oct. 17, 1913. No. 46251 A.

Hydraulic Laboratory for Irrigation Investigations, Fort Collins, Colo. V. M. Cone. Illustrated description of the laboratory at Fort Collins, Colo., and the work in progress. 2000 w. *Eng News*—Oct. 2, 1913. No. 45653.

Leveling

Recent Improvements in Leveling Instruments. Dunbar D. Scott. Remarks on the fundamental requirements of leveling instruments, with criticism of types, and an illustrated description of the new

Magnetic Declinations

"Compensation Level" and explanation of its advantages. 6000 w. Pro Am Soc of Civ Engrs—April, 1913. No. 41645 F.

Precise Leveling in Private Practice. W. E. Jessup. Gives facts aiming to show the desirability of precision levels in private practice because of their low cost, speed, simplicity, reliability and accuracy. 2500 w. Wis Engr—March, 1913. No. 41572 C.

Precise Leveling in New York City. Frederick W. Koop. Gives in detail the organization and methods of work and the whole procedure. 8000 w. Eng News Sept. 4, 1913. No. 44985.

Magnetic Declinations

The Determination of the Magnetic Meridian. J. A. MacDonald. Directions for observing with explanation of a specimen observation. 2000 w. Con Engr—Sept. 4, 1913. No. 44958.

Maps

A Land Map of the World on a New Projection. B. J. S. Cahill. Points out the inadequacy of the projections now in use, and explains the principles of the new projection, showing some of the uses to which it can be applied. Ills. Discussion. 14400 w. Jour Assn of Engng Soc—Oct, 1913. No. 46148 C.

Meters

Characteristics of Cap and Screw Current Meters; Performance of These Meters in Tail-Races and Large Mountain Streams; Statistical Synthesis of Discharge Curves. Continued discussion of B. F. Groat's paper. 6500 w. Pro Am Soc of Civ Engrs—April, 1913. No. 41649 F.

Development in V-Notch Recording Meter. Joseph Escherick. Explains the advantages of this type of meter for measuring water and other liquids. Ills. 1000 w. Power—July 15, 1913. No. 43698.

Photography

Photography in a Pneumatic Tool Plant. Illustrated description of methods used in connection with the work of the Ingersoll-Rand Co.'s publicity bureau. 1200 w. Ir Age—Nov. 14, 1912. No. 37750 C.

Pitot Tube

Origin and Theory of the Pitot Tube. A. E. Guy. Critical discussion of articles by John Airey, and reviewing information concerning Pitot tubes. Ills. 3500 w. Eng News—June 5, 1913. No. 42699.

Planetables

Planetable Methods as Adapted to Geologic Mapping. Carroll H. Wegemann. Gives a detailed description of planetable methods as adapted to geologic mapping in areas where no adequate base

MEASUREMENT

map is at hand. Map. 6500 w. Ec-Geol—Oct.-Nov., 1912. No. 38500 D.

Rock Tests

The Physical Testing of Rock for Road Building. Albert T. Goldbeck and Frank H. Jackson, Jr. From the Office of the Pub. Roads, Bul. 44. On the methods used and results obtained. Ills. 2500 w. Sci Am Sup—Nov. 9, 1912. Serial. 1st part. No. 37340.

Run-Off

Derivation of Run-Off from Rainfall Data. Joel D. Justin. Gives methods and formulae derived from a study. 2500 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44783 F.

Slabs

Bending Moments in Flat Slabs. V. J. Elmont. A modification of Grashof's general bending moment theory, for consideration of uniformly distributed load. 800 w. Can Engr—Sept. 25, 1913. No. 45503.

Slide Rules

Some New Slide Rules and Their Accuracy. Harold A. Thomas. Considers some of the slide rules now in use and their merits and demerits, and also some new rules and their advantages. 4500 w. Indiana Engng Soc—1912. No. 41730 N.

Soil Tests

Hardpan and Other Soil Tests. J. Norman Jensen. Describes tests made in Chicago and reports results. 2500 w. Eng News—March 6, 1913. No. 40353.

Solar Observations

Azimuth by Direct Solar Observation. Louis Ross. Gives a formula developed by the writer with explanation of the method. Diagrams and tables. 3000 w. Eng News—March 6, 1913. No. 40352.

Stadia Float

Current Observations with a Stadia Float. B. L. G. Rees. Reports conditions and observations in connection with bulk-head construction at Brunswick, Ga., illustrating and describing the float used. 1600 w. Eng News—Feb. 20, 1913. No. 39977.

Stone Testing

See Concrete Testing, under Measurement.

Stresses

An Experimental Determination of the Stresses in a Roof-Truss. Cecil Howard Lander, Gilbert Cork and Joseph Ernest Petard. Report of an experimental roof-truss tested to destruction. Ills. 2000 w. Inst of Civ Engrs—No. 3944. No. 39297 N.

Calculations on Arched Beams (Berechnung gewölbter Platten). Huldreich Keller. Mathematical determination of stress-

Stresses

Consult Classification of the Index. See page 9.

Stresses

MEASUREMENT

Surveying

es induced from arch action. Ills. Serial. 1st part. 5500 w. Zeitschr des Ver deutscher Ing—Dec. 7, 1912. No. 39034 D.

Calculations on the Deflection of Continuous Beams (Berechnung der Durchbiegungen kontinuierlicher Balkenträger). Michael Gombos. Formulae for reinforced-concrete highway bridges. Ills. 3300 w. Beton u Eisen—Feb. 13, 1913. No. 40524 E.

Kinetic Effects of Crowds. C. J. Tilden. An experimental study attempting to throw light on the question of determining and analyzing the forces exerted by an individual in motion, applying to the effect of crowds. Ills. 4500 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41309 F.

The Theorem of Three Moments. Continued discussion of J. P. J. Williams' paper, with author's closure. 2500 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41320 F.

Initial Stresses in Structural Steel. Joseph R. Worcester. Shows the prevalence of initial stresses and considers their origin. Shows the importance of eliminating cold straightening as far as possible from the shop treatment of metal for compression members. 2000 w. Jour Assn of Engng Soc—April, 1913. No. 41287 C.

Simple Method for Determining Stresses in Hingeless Elastic Arch Ribs. T. J. Wilkerson. Describes method, applying to an example. Ills. 7500 w. Pro Engrs' Soc of W Penn—March, 1913. No. 41689 D.

Report on Test for Actual Stresses of the A. J. Franks Building. W. K. Hatt. Illustrated report of tests of a reinforced concrete building. 1500 w. Indiana Engng Soc—1912. No. 41736 N.

Approximate Calculations on Rectangular Plates (Angenäherte Berechnung rechteckiger Platten). H. Lorenz. Empirical formulae evolved from definite bases. Diagrams. 2300 w. Zeit des Ver deutscher Ing—April 19, 1913. No. 42142 D.

The Distribution of Stress in a Cement Briquette. E. G. Coker. Illustrated description of an optical method for the investigation of the strains in a body under stress. 1800 w. Sci Am Sup—June 21, 1913. No. 42943.

General Method for Drawing Influence Lines for Stress in Simple Trusses. Malver A. Howe. Mathematical study. Diagrams. 2000 w. Eng News—June 12, 1913. No. 42813.

The Measurement of Actual Stresses. Arthur R. Lord. Treats of present progress and future possibilities in de-

termining actual stresses in reinforced-concrete buildings. 2000 w. Concrete-Cement Age—July, 1913. No. 43733.

See also same heading, under MECHANICAL ENGINEERING, *Measurement*.

Surveying

Laying-Out Curves (Sur le tracé des courbes). M. Laplace. Special problems of difficult nature; when point of intersection is inaccessible or not visible; when points on curve are inaccessible; when point of tangency is not visible, etc. Ills. 2000 w. Bull Tech d l Suisse Romande—Oct. 25, 1912. No. 37506 D.

Notes on Signals for Use in Hydrographic Surveying. A. Rust. Drawings and description of steel signal towers and their use, the signals, and proper outfit for efficient surveying. 4500 w. Pro U S Nav Inst—Dec., 1912. No. 38642 E.

City Surveying in Brooklyn. John B. Stein. Read before the Brooklyn Engrs' Club. Describes the duties and organization of the Topographical Bureau, and work of the bureau. Ills. 5500 w. Eng News—Dec. 19, 1912. No. 38332.

Surveys of Property in Pennsylvania. Louis P. Blum. Discusses circumstances which must be considered in establishing property lines in accordance with original lines and the laws of the Commonwealth. General discussion. 16500 w. Pro Engrs Soc of W Penn—Oct., 1912. No. 38279 D.

Method of Conducting Topographic Surveys for Drainage Districts. Walter A. Birket, in a paper before the Ill. Soc. of Engrs & Survs. Discusses the purpose of topographic surveys for drainage work and describes methods of conducting them. 2500 w. Engng & Con—March 12, 1913. No. 40457.

Precise Surveys for Mount Royal Tunnel. J. L. Busfield. Describes methods of procedure in surveying for this tunnel on the Canadian Northern Ry. near Montreal. Ills. 2500 w. Can Engr—Feb. 27, 1913. No. 40296.

Stereophotographic Surveying. Otto Lemberger. A short history of the development of photographic surveying in Europe, with examples; the invention of stereophotogrammetry, its practice and theory, and description of the instruments used. Editorial. Ills. 8500 w. Eng News—March 27, 1913. No. 40937.

Theory and Practice of Stadia Surveying. J. A. MacDonald. Encourages the use of this method of surveying. 3500 w. Can Engr—April 3, 1913. No. 41101.

The Topographic Survey of Cincinnati. Hugh C. Mitchell. Describes the survey of a thickly settled city, primarily for the improvement of the sewerage system, giving the various steps in detail. Ills.

Surveying

3500 w. Eng News—April 3, 1913. No. 41065.

Fieldwork and Computations for Laying Out Subdivisions on Curved Street Lines. J. H. Anderson. Describes some of the problems met in laying out the work. 2000 w. Eng News—April 24, 1913. No. 41623.

Base Line Measurement. Edw. K. Smith. Deals with methods of measurement of geodetic base lines. 3000 w. Wis Engr—May, 1913. No. 42444 C.

Stereo Photo Surveying. Henry Hess. An account of the remarkable results made possible by this apparatus. Ills. 3000 w. Prof Engrs' Club of Phila—April, 1913. No. 42364 D.

Surveying by Photography. Benjamin Smith Lyman. Suggests methods of applying photography to surveying. 1200 w. Pro Engrs' Club of Phila—April, 1913. No. 42365 D.

A Topographical Survey of the Spirit and Okoboji Lakes Region. H. C. Ford. Descriptive account of the work. Map and Ills. 36 pp. Bul No. 32, Iowa State College of Agri and Mech Arts—March, 1913. No. 43759 N.

Points in the Progress & Inspection of Surveys. E. W. Hubbell. Historical sketch of the growth of the Canadian Department of the Interior surveys branch, and related subjects. 6500 w. Can Engr—Aug. 14, 1913. No. 44396.

Some Practical Examples of Provincial Land Surveying. J. A. Macdonald. Shows the wonderful accuracy of old compass surveys, and gives typical instances in the re-survey of old lines, where the surveyor must arbitrate. 3000 w. Can Engr—Sept. 25, 1913. No. 45504.

Plane Table Survey in Asia Minor. Lloyd T. Emory. An account of experiences in mountain work with Turkish rodmen, and side lights on the people, country and climatic conditions. Ills. 2500 w. Eng Rec—Oct. 18, 1913. No. 45942.

Topographical Surveys Made by the American Section of the International Boundary Commission, United States and Mexico. W. W. Follett. Describes methods and gives results of work. 14500 w. Pro Am Soc of Civ Engrs—Oct, 1913. No. 46343 F.

See also Solar Observations, under *Measurement*, and Bore-Hole Surveying, under *MINING AND METALLURGY, Mining*.

Surveying Instruments

See Location, under *RAILWAY ENGINEERING, Permanent Way and Buildings*.

Testing Laboratories

The Testing Laboratory and the Consulting Engineer. H. W. Hayward. Ab-

MEASUREMENT

stract of paper read at Boston, with short discussion. The importance of testing materials. 1800 w. Jour Am Soc of Mech Engrs—March, 1913. No. 40438 D.

Tests

Some Studies on the Testing of Materials of Construction (Sugli studi e sulle prove dei materiali da costruzione). I. Maganzini. First part is an historical sketch of former crude methods of testing various materials. Ills. Serial. 1st part. 2000 w. Il Cemento—April 30, 1913. No. 42505 D.

Theodolites

Specification of a Precision-Theodolite. L. H. Cooke. Outline of a specification of a theodolite for mining purposes and other precise work. Ills. 4000 w. Inst of Min & Met, Bul 99—Dec. 12, 1912. No. 38880 N.

Some Considerations on the Specification of Theodolites for Mines. L. H. Cooke. Calls attention to defects in these instruments used for mine surveying, and gives a specification. 11000 w. Inst of Min & Met, Bul 100—Jan. 9, 1913. No. 39549 N.

Discussion on "Some Considerations on the Specification of Theodolites for Mines" and "Specification of a Precision of Theodolite: For Workings on Lodes of Medium Inclination and Narrow or Medium Thickness." L. H. Cooke. With contributed remarks and author's interim reply. 19500 w. Inst of Min & Met, Bul 101—Feb. 13, 1913. No. 40216 N.

Timber Testing

See Timber, under *Materials of Construction*.

Topographical Bureau

The Topographical Bureau of the Borough of Brooklyn, City of New York; Its Relation to Other Bureaus, and Its Importance in City Government. John B. Stein. Explanation of the organization and work of this bureau. Discussion. Ills. 5000 w. Brooklyn Engrs' Club—1912. No. 46398 N.

Truss Calculations

Design and Graphic Method for Calculating a Steel Truss. Leonard Goodday. Gives a stress diagram as applied to design of roof for gymnasium. Ills. 700 w. Can Engr—Aug. 14, 1913. No. 44394.

Venturi Meters

Venturi Meter Coefficients. Allen Hazen. Discusses errors in Venturi measurements. Also discussion by Clemens Herschel and J. W. Ledoux, with Mr. Hazen's reply. 5000 w. Eng News—July 31, 1913. No. 44109.

Consult Classification of the Index. See page 9.

Wind Pressure**Wind Pressure**

Wind Pressure on Buildings. Albert Smith. An account of tests made on model buildings, particularly mill build-

MUNICIPAL**Cost Keeping**

ings and other open structures not braced by intermediate floors. Ills. General discussion. 7000 w. Jour W Soc of Engrs—Dec., 1912. No. 39337 D.

MUNICIPAL**Atmospheric Pollution**

Methods for Investigating and Recording Atmospheric Impurities, Including the Soot and Dust Suspended in the Atmosphere. John B. C. Kershaw. Gives methods that have been suggested or tried. Ills. 3000 w. Med. & Chem Engng—June, 1913. No. 42609 C.

Bath Houses

Sanitary Features of Coney Island Bath House. Harold L. Alt. Plans and description of arrangements at the new municipal bath house. 1200 w. Dom Engng—Dec. 21, 1912. No. 38377.

Baths

See Public Baths, under *Water Supply*.

Budgets

See Public Works, under **INDUSTRIAL ECONOMY**.

City Planning

The Chicago Plan. Charles H. Wacker. Explains the problem at Chicago and outlines the objects of the future plan. 3000 w. Jour W Soc of Engrs—Jan., 1913. No. 39956 D.

City Planning as Practised in Europe. L. S. Smith. Considers the aims of city planning in Germany and England, and the results. Ills. 3000 w. Wis Engr—March, 1913. No. 41576 C.

Scientific City Planning. George B. Ford. Read at the Fifth Nat. Conference on City Planning. An outline for a standardized procedure by means of which a proper plan can be determined. 3500 w. Engng & Con—May 14, 1913. No. 42088.

The Planning of City Streets. B. Antrim Haldeman. Discusses the importance of the street system and some of its problems, illustrating and describing streets in Germany and other countries. General discussion. 8800 w. Pro Engrs' Club of Phila—April, 1913. No. 42366 D.

A City-Planning Program. Frederick Law Olmstead. Discusses and describes a City Plan Office and its important work. 5000 w. Jour Am Inst of Archts—June, 1913. No. 42717 D.

The Land Tax Method of Raising Funds for the Park and Boulevard System of Kansas City, Mo. Gives method as described by George E. Kessler in a paper at the fifth national conference on city planning. 2200 w. Engng & Con—June 18, 1913. No. 42939.

Transportation and City Planning.

Milo R. Maltbie. Abstract of a paper read at Chicago. Emphasizes the close relation between city development and transportation facilities. 2200 w. Elec Ry Jour—June 21, 1913. No. 43117.

Suggested Plan of Procedure for City Planning Commission. Abstract of a report by Messrs. E. P. Goodrich and Geo. B. Ford, giving matters relating to streets. 4000 w. Engng & Con—Aug. 27, 1913. No. 44774.

Important Elements in Town Planning. Christopher J. Yorath. Considers briefly the aim, points to be considered, building restrictions, &c. 3000 w. Con Rec—July 30, 1913. No. 44141.

The Preparation of Town Planning Schemes. J. E. Wilkes. Discusses the fundamental principles of the subject. Ills. 3000 w. Surveyor—Aug. 15, 1913. No. 44715 A.

City Planning. Richard Schermerhorn, Jr. Considers what has been accomplished in Europe and in American cities, work in progress, and the needs of Brooklyn. Ills. Also discussion. 9500 w. Brooklyn Engineers' Club—1912. No. 46396 N.

See Town Planning, under *Municipal*.

City Supplies

Central Purchase and Distribution of Supplies for New York City. Gives a plan for controlling and standardizing purchasing methods of 128 different municipal departments and boards. 4500 w. Eng Rec—March 29, 1913. No. 40960.

City Surveys

See Surveying, under *Measurement*.

City Traffic

The Enormous Traffic in Large Cities. Eugen Fassbender. Considers railway installations, traffic, pedestrians and independent vehicles, and the problems related. Ills. 3000 w. Bul Int Ry Cong—June, 1913. No. 43172 G.

A Five-Storeyed Street. Henry Harrison Suplee. Illustrates and describes a plan for handling congested traffic in large cities. 1500 w. Cassier's—June, 1913. No. 42868 B.

Cost Keeping

Cost-Keeping as Applied to Municipal Management of Street Cleaning. Abstract of a paper, by G. W. Raxton, read before the Am. Pub. Health Assn. Brief description of the system developed at

Consult Classification of the Index. See page 9.

Delhi, India

Washington, D. C. 2000 w. Engng & Con—Sept. 17, 1913. No. 45226.

Delhi, India

The Government and Public Works of Delhi, India. Tom Salkield. Slightly condensed from *Jour. Roy. San. Inst.* Considers the water works, drainage, refuse collection and disposal, and general features. 3300 w. Eng News—May 22, 1913. No. 42353.

Drainage

Glasgow Main Drainage Scheme. Frank I. Cohen. Illustrated description of one of the largest installations of its kind in the world. 3500 w. Sci Am Sup—Dec. 7, 1912. No. 38072.

Main Drainage of Glasgow. Paper 3991 by Alexander Beith McDonald and Gotfred Midgley Taylor, Paper 3936 by William Cecil Easton, Paper 3981 by David Home Morton, discussed together. Plates. 127 pp. Inst of Civ Engrs—March 19, 1912. No. 39271 N.

Prevention of Mosquito Breeding. Spencer Miller. Gives the "Mosquito Brief" prepared by the American Mosquito Extinction Society, with related information. 3000 w. Pro Am Soc of Civ Engrs—Nov., 1912. No. 38288 F.

Prevention of Mosquito Breeding. Discussion of the paper by Spencer Miller. 2000 w. Pro Am Soc of Civ Engrs—Jan., 1913. No. 39391 F.

The Main Drainage of Gerrards Cross. Arthur Gladwell. Read before the Inst. of Marine & Co. Engrs. A descriptive account, explaining the difficulties. General discussion. 5600 w. Surveyor—May 2, 1913. No. 41999 A.

West End Drainage Scheme, Ottawa. L. McL. Hunter. Line Drawings and description, with costs. 1000 w. Con Rec—April 30, 1913. No. 42073.

See also Sewerage, under *Municipal, and Drainage, under RAILWAY ENGINEERING, Permanent Way and Buildings.*

Efficiency

Work of the Efficiency Division, Chicago Civil Service Commission. Extracts from a report summarizing four years' work and showing how such an organization can improve municipal administration. 3000 w. Eng Rec—June 7, 1913. No. 42713.

Financing

The Financing of Municipal Works. R. O. Wynne-Roberts. A comparison of British, Canadian and South African methods. 4000 w. Can Engr—Aug. 14, 1913. No. 44399.

Fire Alarms

Recent Developments in Operating Equipment in St. Louis Fire-Alarm Office. George McD. Johns. Read before the St.

MUNICIPAL

Garbage Disposal

Louis League of Elec. Interests. Describes the new equipment recently installed in the St. Louis City Hall. 2200 w. Elec Rev & W Elect'n—April 5, 1913. No. 41104.

The "Knight" Public Fire-Alarm System. E. E. Moore. States the requirements the apparatus was designed to cover and illustrates and describes the instruments and their working. 8000 w. Inst of Elec Engrs—Jan, 1913. No. 43296 N.

Fire Apparatus

Recent Motor Equipment in the New York Fire Department. Remarks on the changes in progress in all the fire departments in the United States and the efforts to improve the types of motor fire apparatus, considering types in detail. Ills. 4500 w. Engng—March 14, 1913. Serial, 1st part. No. 40821 A.

Fire Losses

Cities Unburnable! F. W. Fitzpatrick. Discusses the uselessness of our enormous fire losses. Ills. 2500 w. Casier's—June, 1913. No. 42864 B.

Fire Prevention

Methods of Fire Prevention. An account of the excellent work done by the British authorities. 2500 w. Sci Am Sup—March 15, 1913. No. 40638.

See also Fire Extinguishers, under *MARINE AND NAVAL ENGINEERING.*

Food Preservation

The Scientific Advancement of the Canning Industry. R. T. Mohan. Read before the Canadian Sec of the Soc of Chem Ind. Illustrated review of the canning industry, the early difficulties, present methods, utilization of waste products, etc. 6000 w. Sci Am Sup—July 19, 1913. No. 43781.

Garbage

Methods of Garbage Disposal Applicable to Conditions in the Smaller Cities, with Some Costs and Other Data. Samuel A. Greeley. Read before Illinois Soc. of Engrs & Survs. Discusses the Methods economically available for cities of from 10,000 to 75,000 population. 3500 w. Engng & Con—Feb. 12, 1913. No. 39834.

Garbage Disposal

A Summary of the Arguments and Conclusions of the Members of the Board of Appraisers of the Chicago Garbage Reduction Plant. The purpose of the appraisal was to determine the fair price that the city should pay for the privately owned garbage plant. 6500 w. Engng & Con—Oct. 22, 1913. No. 46129.

Destruction of Garbage by Incineration. H. C. Andrews. Shows that this is the most hygienic method of dealing with garbage, and considers the design of a

Consult Classification of the Index. See page 9.

Housing

modern plant. 1500 w. Can Engr—Oct. 16, 1913. No. 45954.

Results of Garbage Reduction at Columbus, Ohio. Describes briefly a solution of the problem resulting in profit. 1600 w. Munic Engrg—Oct. 1913. No. 46144 C.

Housing

The Housing Problem and Its Solution. Reginald Brown. Read before the Inst. of Munic. & Co. Engrs. Discusses the subject in relation to town planning. General discussion follows. 9500 w. Surveyor—Sept. 12, 1913. No. 45292 A.

Incinerator

Islais Creek Incinerator at San Francisco. Illustrated description of a municipal plant embodying the latest ideas in incinerator practice. 1500 w. Eng Rec—Aug. 16, 1913. No. 44427.

Leeds

Some Municipal Works and Practices in Leeds. W. T. Lancashire. Read before the Munic. & Civ. Engrs. Brief review of important undertakings. 2000 w. Surveyor—March 21, 1913. No. 41006 A.

London

Greater London: Its Area, Population, and Traffic. A. J. Lawson. General information and statistics. 6000 w. Tram & Ry Wld—March 13, 1913. No. 41003 B.

Mine Effects

Mining Effects upon Public Structures, Especially Street Railways, and Measures for Lessening the Dangers (Einwirkung des Bergbaues auf Gebäude, öffentlich unbesonders Strassenbahn-Anlagen, sowie Massnahmen zur Minderung, der Schäden) Hr. Nolden. An outline of the damages on streets and buildings, with methods of preventing same. Ills. Serial, 1st part. 4000 w. Elek Kraft u Bahnen—Oct. 4, 1913. No. 46094 D.

Municipal Law

Legal Questions Involved in the Proposed Amendments to the General Municipal Law of New York. William M. Bowman. Law in regard to contracts is discussed and criticized. 11000 w. Jour Am Soc of Engng Contr—April, 1913. No. 43756 C.

Municipal Plants

Holyoke Municipal Gas and Electric Works. Reviews the history of development of ten years of municipal ownership. Ills. 2500 w. Munic Jour—Aug. 7, 1913. No. 44288.

Seattle's Municipal Light and Power Plant. J. D. Ross. Brief illustrated description of a plant of 20,000 h. p., which lights 6,000 street lamps and serves 27,000 customers, earning 8 per cent. 1500 w. Munic Jour—Aug. 7, 1913. No. 44289.

MUNICIPAL

Wallingford Municipal Electric Works. Illustrated description of a plant in a city of 11,000, operated by steam and water power. 2200 w. Munic Jour—Aug. 7, 1913. No. 44290.

Municipal Works

Wrexham and Its Municipal Works. J. England. Read before the Inst. of Munic. & Co. Engrs. Illustrated description, with discussion. 5500 w. Surveyor—Oct. 25, 1912. No. 37290 A.

Business Methods for Municipal Enterprises and Improvements, from an Engineering Point of View. Eugene Shinn. Gives a resumé of municipal work during the past 25 years, improvements introduced, and an explanation of a plan worked out by the author, also discussion. 7000 w. Brooklyn Engrs' Club—1912. No. 46397 N.

Newcastle, Eng.

Ouseburn Valley Works. Frank I. Morgan. An illustrated account of the filling of this valley which intersects Newcastle, the making of thoroughfares, and a reinforced-concrete culvert. Also discussion. 7500 w. Surveyor—May 16, 1913. No. 42533 A.

New Jersey Rules

Rules Governing the Submission of Sewerage and Water-Supply Plans to the New Jersey State Board of Health. Reprint in full of rules for sewerage and sewage disposal and parts of the rules for water supply. 4000 w. Eng News—Sept. 18, 1913. No. 45221.

Rules and Regulations of the New Jersey State Board of Health Relative to Reports on Water Supply and Water Purification Systems. The requirements with which all applicants should comply. 2000 w. Engng & Con—Sept. 24, 1913. No. 45455.

Uniformity in Sewer Plans. Gives New Jersey State Board of Health's new regulations. 2500 w. Eng Rec—Sept. 6, 1913. No. 44998.

Purchasing

Cincinnati's Purchasing System. Describes a simple system so complete that information on any purchase can be secured immediately. 2000 w. Munic Engrg—Sept., 1913. No. 45208 C.

Refuse

The British Method of Disposing of House Refuse by Crushing and Pulverizing It to a Fertilizing Powder. James A. Seager. Drawings of the crusher and description of the method. 1800 w. Engng & Con—July 23, 1913. No. 43875.

Mixed Method Garbage and Waste Disposal. E. B. Stuart. Describes the garbage and waste disposal plant at Boulogne-sur-Mer, France. Ills. 3500 w. Munic Engrg—July, 1913. No. 44036 C.

Refuse Collection**Refuse Collection**

Street Cleaning and Garbage Collection Methods in Chicago. Equitable distribution of funds is sought by standardizing the work. 4000 w. Eng Rec—Jan. 4, 1913. No. 38805.

Refuse Destructors

Salient Features of Modern Refuse Destructor Practice in Great Britain. James A. Seager. Gives typical examples which indicate the advance made. 2500 w. Engng & Con—Feb. 12, 1913. No. 39835.

Recent Refuse Destructor Plants (Neuere Müllverbrennungsanlagen). Norbert Wechsler. General characteristics of the more important European types of furnaces and equipment. Ills. Serial. 1st part. 4800 w. Zeit d Oest Ing u Arch Ver—April 11, 1913. No. 42147 D.

A Test of a Refuse Destructor at Smethwick. W. Naylor. Illustrated account of the plant and test. 1500 w. Surveyor—May 23, 1913. No. 42749 A.

Improvement in Garbage Incinerators. John Hammersley-Heenan. Illustrates and describes early and improved designs. 3000 w. Con Rec—July 16, 1913. No. 43816.

Refuse Disposal

The Studies Made in Estimating the Cost of Refuse Disposal in Chicago. Gives estimates of cost and characteristics by wards for rubbish and garbage service in Chicago. Map. 4000 w. Engng & Con—Jan. 15, 1913. No. 39185.

The Development of the Pentre Valley in Relation to the Destructor. G. H. Bell. Describes the refuse destructor, explaining the advantage to the corporation. Ills. 2500 w. Surveyor—Jan. 17, 1913. No. 39467 A.

The Exportation and Sale of City Refuse (Dell'esportazione e dello smaltimento delle immondizie urbane). R. Badoglio. Details of Italian methods of refuse collection and garbage disposal. Ills. Serial, 1st part. 5400 w. Ann della Soc d Ing e d Arch Ital—Feb. 1, 1913. No. 40607 E.

Pasadena's Refuse Incinerator. C. L. Edholm. Illustrated description of the plant, with report of efficiency of a plant of the same type at Portland, Ore. 1500 w. Munic Jour—April 17, 1913. No. 41325.

Electricity from Sweepings (Elektrizität aus Kehricht). F. P. Tilmetz. A use for street sweepings, garbage and other refuse, and examples of such utilization. Ills. Serial. 1st part. 5500 w. Elek Kraft u Bahnen—March 14, 1913. No. 41501 D.

MUNICIPAL**Sanitation**

Collection and Disposal of Boston Refuse. Describes plan for delivering municipal wastes to waterfront stations, whence it is transferred to an island and disposed of by reduction and incineration. Ills. 5000 w. Eng Rec—May 10, 1913. No. 41954.

New York City's New Garbage Disposal Contract. Gives the conditions of a remarkable contract recently signed. 2000 w. Eng News—Aug. 7, 1913. No. 44254.

See also Incinerators and Garbage Disposal, under *Municipal*.

Refuse Removal

The Principles of Municipal Refuse Collection. Samuel A. Greeley. Deals chiefly with the collection of house refuse; the house treatment, the collection, and the disposal of the refuse. Ills. Discussion. 16500 w. Jour W Soc of Engrs—Nov., 1912. No. 38560 D.

A Factory Refuse Removal System. Illustrated description of a design of blower piping and other shavings removal equipment of a wood-working plant. 1200 w. Met Work—Dec. 13, 1912. No. 38191.

Sanitary Ware

Porcelain Enameled Iron and Its Relation to Sanitation. C. B. Nash. Introductory remarks on early methods of enamelling, especially considering its application to sanitary ware. Ills. 2000 w. Plumb & Dec—Aug. 1, 1913. No. 44302 A.

Sanitation

Sanitation—Some of the Things We Must Face. D. G. McLeod. Read before the Duluth Archt. Club. Discusses the importance of good plumbing, the sanitation of public buildings, factories, etc. 2500 w. Dom Engng—Dec. 21, 1912. No. 38378.

Sanitary Engineering in 1912. Reviews the progress in England mainly. 3000 w. Engr, Lond—Jan. 3, 1913. No. 39162 A.

Seeing New York With the Sanitary Engineer. J. X. Cohen. Notes relating to water filters, sewage works and refuse destructors in or near the city. 4000 w. Eng Rec—Jan. 18, 1913. No. 39191.

Sanitation at Mining Villages in the Birmingham District, Ala. Dwight E. Woodbridge. Describes the sanitary conditions of this iron mining district in 1912 and earlier and the methods successfully practiced. Ills. 6000 w. U. S. Bureau of Mines—Tech. Paper 33. No. 45499 N.

The Lesson of Canal Zone Sanitation. J. S. Lankford. Describes the conditions in the canal zone when the United States took charge, and the wonderful sanitary work and the change it wrought. 2000

Consult Classification of the Index. See page 9.

Seattle

w. Pop Sci M—Sept., 1913. No. 45177 C.

See Panama Canal, under *Waterways and Harbors*.

Seattle

Development of Seattle. Describes the plans for the extension of steamship terminals. Ills. 1400 w. Marine Rev—June, 1913. No. 42806 C.

Sewage

House Drainage Regulations on the Continent. Frank R. Durham. Read before the Inst. of San. Engrs. Comments on the more interesting regulations. 4500 w. Surveyor—May 2, 1913. No. 42000 A.

Some Structural Features of the Flint, Mich., Sewerage and Drainage System. Drawings and information from the plans and report. 1000 w. Engng & Con—May 14, 1913. No. 42090.

Sewerage and Drainage Improvements at Edmonton. Alexander Potter. Brief illustrated description of tunnel systems. 1200 w. Con Rec—April 30, 1913. No. 42069.

Permissible Dilution of Sewage. George W. Fuller. Considers the hygienic aspects of sewage disposal and that dilution is permissible provided complications can be prevented as far as disease germs are concerned. Discussion. 8000 w. Jour W Soc of Engrs—May, 1913. No. 42924 D.

Some Observations on the Formation of Hydrogen Sulphide in Sewage. Dr. Arthur Lederer. Read before the San. Engng Sec. of the Pub. Health Assn. Considers the formation of hydrogen sulphide in its relation to inorganic or organic sulphur compounds. 4000 w. Chem Engr—Aug., 1913. No. 44803 C.

Measuring the Sewage of Sacramento. The Variation in pressure on the convex and concave sides of pipe elbows furnished a means of rating the discharge. 1500 w. Eng Rec—Aug. 16, 1913. No. 44432.

Method of Distributing Sewage on Bacteria Beds. From a paper by U. W. Adams. The bacterial system adopted at Fenton, Eng., is illustrated and described. 1800 w. Con Rec—Sept. 3, 1913. No. 44935.

Fresh Sludge and Decomposed Sludge. Hermann Bach and Leslie C. Frank. Comparative analyses and discussion of sludge utilization possibilities. 4000 w. Eng Rec—Sept. 20, 1913. No. 45271.

Standards with Reference to Sewage Treatment. T. Aird Murray. Read before the Can. Pub. Health Assn. Discusses the disinfection of sewage effluents, with special reference to Canadian conditions. 3000 w. Con Rec—Sept. 24, 1913. No. 45451.

MUNICIPAL

Sewage Disposal

The Bacterial Clarification of Sewage. Gilbert J. Fowler and E. Moore Mumford. From a paper read before the Ry. San. Inst. Explains a proposed process. 1800 w. Surveyor—Aug. 22, 1913. No. 44911 A.

Sewage Disinfection in Philadelphia. W. L. Stevenson. Illustrates and describes details of apparatus for treating effluent of Pennypack Creek Works. 1500 w. Eng Rec—Sept. 6, 1913. No. 44992.

Sewage Purification at Atlanta, Ga. Gives results of tests conducted over a period of six months on the largest installation of Imhoff tanks in America. Ills. 2500 w. Munic Engng—Sept., 1913. No. 45209 C.

Sewage Disposal

Operating Results of Imhoff Sewage Tank. Fred H. Tibbetts. Abstract of a paper before the League of Calif. Munic. Describes the structural features of the tank at Winters, Cal., and gives operating results. 2000 w. Can Engr—Oct. 31, 1912. No. 37265.

A Study of the Economic Limits of Sewage Treatment with Special Reference to Imhoff Tanks and Their Use. Henry H. Ogden. From a paper read before the Am. Soc. of Munic. Imp. Discusses the economic limits of sewage treatment, and the essential features of the Imhoff tank process. 2500 w. Engng & Con—Nov. 27, 1912. No. 37925.

Imhoff Tanks. Abstract of a paper by Prof. Ogden, read before the Dallas Convention of the Am. Soc. of Munic. Insp. Explains the principles of their design. Ills. 2500 w. Munic Engng—May, 1913. No. 42413 C.

Design of Imhoff Sewage Plants. Leslie C. Frank and Franz Fries. First of three articles. Discusses the selection of preliminary screens and proportioning of grit chambers. Ills. 2500 w. Eng Rec—Oct. 25, 1913. Serial. 1st part. No. 46207.

British Practice in Sewage Disposal. Arthur J. Martin. Read at the Berlin Cong. of the Roy. Inst. of Pub. Health. History of the sewage problem with description of present practice. 5000 w. Eng Rec—Nov. 2, 1912. No. 37226.

Bradford Sewage Disposal Works. Illustrated account of a very extensive scheme for the treatment of sewage, which will eventually cost 1½ millions sterling. 1800 w. Engr, Lond—Nov. 8, 1912. No. 37646 A.

Utilization of Humus from Slate Beds. From a paper by W. J. Dibdin on "The Slate Bed Treatment of Sewage." Discussion. 3500 w. Surveyor—Dec. 6, 1912. No. 38240 A.

Sewage Disposal

MUNICIPAL

Sewage Disposal

The Effect of Hydrogen Sulphids on the Concrete of Sewage Disposal Plants. William M. Barr and R. E. Buchanan. From *Bul. Iowa State Col. of Agri. and Mech. Arts*. Gives results of observations of plants and of tests. 3000 w. Eng News—Dec. 12, 1912. No. 38179.

Imhoff Tanks and Sprinkling Filters for Sewage Treatment at the Fulton County Almshouse, Georgia. P. H. Norcross. Drawings and description of the sewage treatment works. 600 w. Eng News—Dec. 26, 1912. No. 38596.

Lethbridge Sewage Disposal Works. T. Aird Murray. Illustrates and describes a plant in Alberta, Canada, for producing an effluent to be disinfected at minimum cost. 2000 w. Eng Rec—Dec. 14, 1912. No. 38198.

General Principles Governing the Discharge of Sewage and Waste Matters into Certain Groupings of Natural Bodies of Water. Gives report of the committee appointed by the Nat. Assn. for Preventing the Pollution of Rivers and Waterways. 1200 w. Engng & Con—Dec. 25, 1912. No. 38553.

Sewage Disposal. J. Darlington Whitmore. Read before the Regina Engng. Soc. Deals with water borne sewage only, tracing an imaginary scheme from the household to the reception and treatment at the disposal works. 4500 w. Can Engr—Jan. 9, 1913. No. 38963.

Disinfection of Sewage and Sewage Filter Effluent. Reports results of experiments by Massachusetts State Board of Health. 4500 w. Eng Rec—Jan. 4, 1913. No. 38802.

Tanks. Arthur J. Martin. Discusses questions in connection with the tank treatment of sewage. Discussion. 3000 w. Surveyor—Dec. 20, 1913. No. 38875 A.

Sludge Disposal at Bradford. Illustrated description of a large scheme for the treatment of sewage. 1700 w. Surveyor—Jan. 3, 1913. No. 39146 A.

Operating Results of the Sewage Disposal Works at Bordentown, New Jersey. C. M. Hartley. Brief illustrated description of the plant, with report of the operating results. 2500 w. Engng & Con—Jan. 1, 1913. No. 38772.

Facts and Fancies About Sewage Disposal. Gilbert Thomson. Abstract of a lecture before the San. Assn. of Scotland. Discusses some of the systems and the complications. 5800 w. Can Engr—Feb. 20, 1913. No. 39972.

Sewage Disposal Investigations at Cleveland. R. Winthrop Pratt. Explains causes for making the tests before building proposed works, and describes the

testing station. Ills. 5000 w. Eng News—Feb. 13, 1913. No. 39857.

Sewage-Disposal Plant at the Great Lakes Naval Training Station. Illustrated description of a plant treating sewage by reduction tanks and anaerobic and sprinkling filters. 1200 w. Eng Rec March 1, 1913. No. 40260.

The Design and Operating of the Institutional Sewage Treatment Plant at Julietta, Indiana. Charles Brossman. Read before the Indiana San. & Water Sup. Assn. Illustrates and describes the design and operation of the plant. 1600 w. Engng & Con—Feb. 26, 1913. No. 40232.

Julietta Sewage Disposal Plant. Charles Brossmann. Brief illustrated description of the first purification plant in Indiana to use the Imhoff tank. 1000 w. Munic Jour—Jan. 9, 1913. No. 38921.

Sewage Treatment-Plant for the Julietta Insane Hospital, Indiana. Charles Brossman. Illustrated description of a plant consisting of a modified Imhoff tank, contact beds, and sand filters. 1000 w. Eng News—May 1, 1913. No. 41863.

A New Type of Sewage Sedimentation Tank, Mount Washington, Md. Howard T. Oliver. Illustrated description of the plant and its operation. 2500 w. Eng News—April 10, 1913. No. 41163.

Sewage Treatment at Norristown, Pennsylvania. P. E. Mebus. Illustrates and describes the plant at the State Hospital for Insane, having 3,500 inmates. 1500 w. Munic Jour—April 24, 1913. No. 41548.

Sewage-Treatment Studies at Akron, Ohio. Reports results of experiments with settling tanks and filters of several types. Ills. 3500 w. Eng Rec—April 5, 1913. No. 41123.

The Sewage Treatment at Atlanta, Ga. W. A. Hansell, Jr. Illustrates and describes the system adopted and treatment, giving results of chemical and bacteriological analysis. 3500 w. Munic Jour—April 3, 1913. No. 41086.

Plans for the Disposal of New York's Sewage. Illustrates and describes a proposed treatment plant on an artificial island three miles offshore. 2000 w. Sci Am—May 31, 1913. No. 42522.

Inoffensive Collection and Disposal of Sewage. Rudolph Hering. Brief discussion of methods and results. Ills. 3800 w. Con Rec—April 30, 1913. No. 42067.

Sewage Treatment. R. J. McKenn. Read before the Inst. of Munic. Engrs. Describes the various parts of sewage works, commencing with the detritus tanks and concluding with the methods of treating sewage. 2500 w. Surveyor—

Sewage Disposal

MUNICIPAL

Sewage Disposal

May 9, 1913. Serial. 1st part. No. 42280 A.

The Design of the Sewage Treatment-Plant at Albia, Iowa. M. G. Hall. Explains conditions and gives an illustrated detailed description of plant. 1500 w. Engng & Con—April 30, 1913. No. 41821.

Sewage Purification. F. H. Tibbetta. Illustrated description of works at Winters, Cal., and the operating results. 2500 w. Munic Engng—June, 1913. No. 43179 C.

Sewage Treatment Works for Fitchburg, Mass. Frank A. Marston. Plans and details of works about to be built, including Imhoff tanks, sludge beds, sprinkling filters and secondary or final settling tanks. 3000 w. Eng News—June 5, 1913. No. 42700.

Structural Features of the Sewage Treatment Works for Fitchburg, Mass. Illustrates and describes the principal novel features in the design of the sewage treatment works. 3000 w. Engng & Con—June 25, 1913. No. 43196.

The Operation of Sewage Disposal Plant at Columbus, O. Illustrated detailed description of the sewage treatment. 2500 w. Munic Engng—June, 1913. No. 43176 C.

The Skilled Supervision of Sewage Purification Works. F. Herbert Snow. An argument in favor of compulsory adequate supervision under state regulation, and the necessity therefor. Discussion. 5500 w. Am Jour Pub Health—June, 1913. No. 43599 C.

The Sludge Problem. Langdon Pearse. Relation of sludge deposits from standpoints of nuisance and hydraulics, to its cures—by dredging, diversion or prevention. 2800 w. Am Jour Pub Health—June, 1913. No. 44002 C.

The Treatment of Sewage Discharged into Tidal Waters. H. C. H. Shenton. Read before the Assn. of Mgrs. of Sewage Disposal Works. A discussion of the degree necessary to purify sewage before discharging into tidal waters. 3500 w. Surveyor—July 4, 1913. No. 43710 A.

Distribution of Sewage on Bacteria Beds. Ulric W. Adams. Illustrates and describes methods adopted at Stoke-on-Trent. 1800 w. Surveyor—Aug. 1, 1913. No. 44313 A.

Sewage Disposal at New Bedford, Mass. Walter N. Charles. Illustrates and describes the intercepting and out-fall sewers under construction. 2000 w. Eng News—July 31, 1913. No. 44113.

Sewage Disposal of the Future. W. H. Makepeace. From a paper read before the Assn. of Mgrs. of Sewage Disposal

Works. 2000 w. Surveyor—July 25, 1913. No. 44172 A.

The Design of the New Sewage Treatment Plant for Madison, Wis. Describes this plant now under construction, particularly the sewage tanks and dosing tanks. Ills. 4500 w. Engng & Con—Aug. 20, 1913. No. 44495.

Shell Fish and Sewage Disposal. George A. Johnson. Discusses the reality of menace to health in shell fish as food. 1500 w. Munic Jour—Sept. 11, 1913. No. 45122.

The Development of Sewage Disposal Practice. E. Sherman Chase. Read before the Ont. Munic. Assn. Historical review of the scientific disposal of waste. 3500 w. Can Engr—Sept. 11, 1913. No. 45123.

Sewage Disposal at Stratford-on-Avon. Herbert D. Bell. Extracts from the last annual report. Information concerning sludge disposal, research work and related matters. 2200 w. Surveyor—Sept. 5, 1913. No. 45147 A.

Sewage Treatment Plant for a Sanatorium. P. H. Norcross. Illustrated description of a plant near Louisville, Ky., for treatment of wastes from a hospital. 1200 w. Eng News—Sept. 18, 1913. No. 45225.

A Review of Good Practice in Sewage Collection and Disposal. Abstract of a progress report made to the Am. Pub. Health Assn. summarizing the best present practice. 3500 w. Engng & Con—Oct. 15 1913. No. 45891.

Royal Commission on Sewage Disposal. H. C. H. Shenton and W. C. Easdale. Extract from the appendix to the eighth report, with notes. 9000 w. Surveyor—Oct. 17, 1913. Serial. 1st part. No. 46230 A.

Obligations of the State to a Municipality Which Has Been Ordered to Dispose of Its Sewage Properly by the State Board of Health. Chester G. Wigley. Read before the Am. Soc. of Munic. Imp. Questions related to the subject are fully discussed. 3000 w. Engng & Con—Oct. 29, 1913. No. 46386.

Distribution of Sewage Sludge in Settling Tanks. Charles Hoopes. Explains the problem and its solution. 1500 w. Eng Rec—Oct. 18, 1913. No. 45940.

The Clarification of Sewage in Slate Beds. Dr. Bach. Trans. from *Technisches Gemeindeblatt*. A description of the construction and operation of slate beds with data concerning their efficiency, limitations and cost. Ills. 4000 w. Eng. News—Oct. 2, 1913. No. 45648.

Travelers for Sewage Distribution. Abstract of paper by Alexander Potter,

Consult Classification of the Index. See page 9.

Sewage Disposal

read before the Am. Soc. of Munic. Imp. Illustrated description of the power-driven traveling distributor at the plant in Springfield, Mo. 2200 w. Eng Rec—Oct. 18, 1913. No. 45943.

Notes on the Sewerage and Sewage Disposal Works and the Mineral Waters and Treatments of Harrogate. C. E. Rivers. Read before the Munic. & Co. Engrs. 5000 w. Surveyor—Oct. 10, 1913. No. 45976 A.

Examination of River Bottoms at Philadelphia in Connection with Sewage Disposal Studies—Methods and Results. W. L. Stevenson. Read before the Am. Pub. Health Assn. Describes these studies. 2000 w. Engng & Con—Oct. 29, 1913. No. 46387.

Springfield Sewage Disposal Plant and Its Departure from Common Practice. Alexander Potter. Illustrated detailed description of plant at Springfield, Mo., using power-driven traveling distributors. 3500 w. Con Rec—Oct. 22, 1913. No. 46151.

Tiverton Sewage Disposal Works. L. D. Holgate. Read before the Inst. of Munic. & Co., Engrs. Describes treatment adopted to overcome offensive odors in the vicinity of the sewage farm. 1800 w. Surveyor—Oct. 3, 1913. No. 45849 A.

Cheltenham Sewage Purification Works. J. S. Pickering. Drawings and description. 2200 w. Surveyor—Oct. 10, 1913. No. 45977 A.

Sewage Filters

Fine Grade Filters, Their Use and Limits. W. H. Makepeace. Read before the Assn. of Mgrs. of Sewage Disposal Works. Thinks with proper attention to the preliminary treatment of the sewage and a reliable distributor, this type is superior to any other. Ills. 1200 w. Surveyor—Jan. 3, 1913. No. 39147 A.

Sewage Flow

Daily Fluctuation in Sewage Flows. William Fairley. Gives curves selected from a number of actual gaugings of the rate of discharge. 1500 w. Inst of Civ Engrs—No. 4008. No. 39298 N.

Sewage Pumping

New Sewage Pumping Station in Detroit. Illustrated description of plant for pumping, the storm water and domestic sewage into the Detroit River. 2000 w. Eng Rec—Dec. 21, 1912. No. 38323.

Some Notes on Modern Sewage Pumping Machinery and Appliances with Illustrative Examples. Illustrates and describes types and installations now in service. 1800 w. Engng & Con—Jan. 29, 1913. No. 39583.

The London County Council's New Sewage Pumping Station. Illustrated description of the Abbey Mills new sew-

MUNICIPAL

age pumping station, with information concerning it. 1500 w. Engr, Lond—July 18, 1913. No. 43975 A.

Sewage Purification

Sewage Purification. James Millar Neil. Illustrated description of the Chemproco sewage disposal system, explaining its advantages. 2500 w. Met & Chem Engng—Feb., 1913. No. 39682 C.

Sewage Purification in the East. B. Ball. Illustrates and describes conditions in Singapore, and gives information concerning the value of coral as a filtering material. 1000 w. Surveyor—Jan. 31, 1913. (Special.) No. 39785 N.

Lawrence Experiment station Studies of the Disinfection of Sewage and Effluents from Sewage Fillets. Information from the latest annual report. Describes experiments made. 6000 w. Engng & Con—Jan. 29, 1913. No. 39584.

Sewage Treatment

Sewage Treatment vs. Sewage Purification. George C. Whipple. Considers, first, the misuse of the latter term, and, second, the lack of advantage in absolute purification. Discussion. 6000 w. Am Jour Pub Health—June, 1913. No. 44000 C.

Sewage Treatment. R. J. McKenn. Read at a District meeting of the Inst. of Munic. Engrs. Deals with the general constructional part of the works, tank treatment, percolating beds, sludge treatment, &c. 4500 w. Plumb & Dec—Aug. 1, 1913. No. 44303 A.

Sewerage

Cincinnati Sewerage Investigations and Surveys. J. E. Root. Gives a brief outline of investigations of present conditions and surveys for future sewerage planning being carried out by the city. 2000 w. Eng Rec—March 29, 1913. No. 40958.

The Covering of Jones' Falls, Baltimore, Md. Illustrated description of the covering of an open creek, as a part of a new sewage construction. The cover will be used as a low-grade street, connecting railway stations and the wharves. 4000 w. Eng News—July 3, 1913. No. 43433.

The Design and Construction of the Jones Falls Stream Improvement, Baltimore, Md. J. J. Frederick. Illustrated description of this work, now nearing completion. 1200 w. Engng & Con—July 9, 1913. No. 43614.

Rhymney Valley Sewerage. Give details of a £222,000 scheme. 1500 w. Surveyor—July 18, 1913. No. 43956 A.

Some Observations on the Formation of Hydrogen Sulphide in Sewage. Arthur Lederer. Studies on the liberation

Sewer Pipe

MUNICIPAL

Sewers

of gases from decomposing sewage. 4700 w. *Am Jour Pub Health*—June, 1913. No. 44003 C.

Effect of Sewerage Upon Health. J. H. Kimball. Shows the relation between the growth of the sewerage system, number of buildings connected and the typhoid rate in Louisville, Ky. Also gives data from other cities. Ills. 2000 w. *Munic Jour*—Aug. 14, 1913. No. 44366.

Sewer Pipe

See also Specifications, under *Materials of Construction*.

Sewers

Laying a Deep Sewer in Bad Ground. George Phelps. Describes a sewer in North Toronto laid at a depth of about 30 feet, the difficulties encountered and methods adopted. Ills. 2000 w. *Can Engr*—Nov. 21, 1912. No. 37773.

Laying Sewers in Water Bearing Material. Charles Hoopes. Describes work at Batavia, N. Y., giving costs under these conditions. 2000 w. *Eng Rec*—Nov. 9, 1912. No. 37359.

Some Notes on the Design and Construction of Storm Water Sewers in Richmond, Va. Allen J. Saville. Describes conditions and explains problems solved in designing and constructing the sewers. Ills. 1000 w. *Engng & Con*—Nov. 20, 1912. No. 37703.

Design and Construction of the O. K. Creek Sewer, Kansas City, Missouri. Illustrated account of the diversion into a large concrete sewer of a stream meandering through the site of the new union passenger terminal. 2500 w. *Eng Rec*—Nov. 2, 1912. No. 37220.

Sewage Construction in Sydney, New South Wales. Illustrated account of a gravitation scheme for Western, Southern, Illawarra and Botany districts. 2500 w. *Surveyor*—Nov. 15, 1912. No. 37814 A.

The Use of Concrete in Sewers. A comparison of designs of concrete sewers showing the tendencies and variations made to suit conditions. Ills. 1700 w. *Munic Engng*—Dec., 1912. No. 38646 C.

Method of Laying a 24-in. Pipe Sewer in 30-ft. Cut in Quicksand in Freezing Weather, at North Toronto, Ontario. George Phelps. Illustrates and describes methods employed. 2200 w. *Engng & Con*—Dec. 25, 1912. No. 38552.

Methods Employed in Laying the Submerged Sewer Outlet Pipe in Lake Ontario, at Rochester, N. Y. Illustrated description of this feature of the extensive work in progress. 1500 w. *Engng & Con*—Dec. 25, 1912. No. 38551.

Sewage of the City of Portland, Ore. T. M. Hurlburt. Describes the natural

conditions, the pioneer sewer systems, and the present types of sewer construction and proposed work. Ills. 3000 w. *Jour Assn of Engng Soc*—Dec., 1912. No. 38652 C.

The Infiltration of Ground Water Into Sewers. John N. Brooks. Data on infiltration, suggesting rational units for the measurement of its quantity. 1500 w. *Pro Am Soc of Civ Engrs*—Dec., 1912. No. 39290 F.

Concrete Sewer Construction in Louisville, Ky. J. H. Kimball. Gives reasons for adopting concrete, and information concerning its wear, etc. Ills. 2000 w. *Munic Engng*—Jan., 1913. No. 39535 C.

Construction of a Concrete Sewer Tunnel Through Difficult Ground. H. S. Philips. Illustrated description of work in Toronto known as Barton Section 1, part of a system of storm overflow sewers. 2000 w. *Can Engr*—Jan. 16, 1913. No. 39380.

New Bedford Intercepting Sewer. Archibald A. Talmage. Describes an intercepting sewer which will cost about \$1,680,000, and have a capacity of 120,000,000 gallons per day. Ills. 8000 w. *Munic Jour*—Jan. 2, 1913. No. 38785.

Louisville's \$5,000,000 Sewers. G. D. Crain. Brief description of extensive sewer work now nearing completion. 2200 w. *Mfrs' Rec*—Feb. 6, 1913. No. 39663.

Rehabilitation of Hoboken Sewerage System. Illustrated description of a proposed gravity system on flat grades flushed automatically with tidewater. 2500 w. *Eng Rec*—Feb. 22, 1913. No. 40107.

Practical Hints on Sewer Construction. W. W. Bridgen. Gives useful suggestions on trenching, jointing pipe and handling concrete work in cold weather. 3000 w. *Eng Rec*—March 1, 1913. No. 40264.

Difficult Sewer Construction at West Liberty, Iowa. Charles P. Chase. Read Before the Iowa Engng Soc. Describes unusual work, explaining conditions. Ills. 2000 w. *Eng Rec*—March 15, 1913. No. 40646.

The Infiltration of Ground Water Into Sewers. Discussion of the paper by John N. Brooks. 5500 w. *Pro Am Soc of Civ Engrs*—March, 1913. No. 41319 F.

The Infiltration of Ground-Water Into Sewers. Continued discussion of the paper by John N. Brooks. 1000 w. *Pro Am Soc of Civ Engrs*—Sept., 1913. No. 45523 F.

Cost of Sewer Trenching with a Carson Machine at Moundsville, W. Va. A. W. Peters. A report of deep trench work,

Sewers

MUNICIPAL

Smoke

explaining conditions. 1500 w. Engng & Con—April 2, 1913. No. 41025.

Construction Work on the Passaic Valley Sewer. Illustrates and describes the methods and apparatus used. 3000 w. Munic Jour—April 3, 1913. No. 41085.

Fairview Sewer and Pumping Station. A. L. Sears. Describes methods and appliances used in Detroit, Mich. Ills. 1800 w. Munic Jour—April 3, 1913. No. 41087.

Sewer Siphons Under New York Subway. Thad. L. Wilson. Explains conditions and describes the sewer work, reporting tests made. Ills. 2500 w. Munic Engng—May, 1913. No. 42412 C.

The Design of Siphon and Grit Chambers for the Main Intercepting Sewer, Fitchburg, Mass. Illustrates and describes two interesting structural features of the main interceptor. 1500 w. Engng & Con—May 28, 1913. No. 42519.

The Infiltration of Ground-Water into Sewers. Continued discussion of the paper by John N. Brooks. 1500 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42914 F.

A Sewer Discharge Diagram. J. M. M. Greig. Gives diagram and formula used with it, with explanation. 500 w. Can Engr—June 5, 1913. No. 42687.

Construction of Tile Pipe Sewers in Chicago. Herbert Edson Hudson. Information concerning the amount of brick and tile sewers in the city, with description of the construction. Ills. 2500 w. Munic Engng—July, 1912. No. 44035 C.

Construction Methods Employed on the Albany Ave. Sewer System in Chicago. Describes work on Troy street between 27th and 28th streets, in constructing a section of brick sewer 9 ft. in diameter. 2500 w. Engng & Con—Aug. 6, 1913. No. 44214.

New Sewage Works at Surbiton. Illustrated detailed description of the new works and information related. 4500 w. Engr, Lond—Aug. 8, 1913. No. 44464 A.

Notes on Tunnelling for Sewers. J. M. M. Greig. Gives instances of difficult construction through unfavorable ground, describing methods used to cope with unstable soil, heavy surface traffic, &c. Ills. 2500 w. Can Engr—Aug. 7, 1913. No. 44278.

The Fitchburg, Mass., Intercepting Sewer. David A. Hartwell. Illustrated account of the design and construction. 3500 w. Jour Assn of Engng Soc—Aug., 1913. No. 44520 C.

The Intercepting Sewer System of Syracuse, N. Y. Glenn D. Holmes. Describes some of the more interesting

features. Ills. 1700 w. Jour Assn of Engng Soc—Aug., 1913. No. 44519 C.

Launching a Submerged Sewer Outfall at Ocean Grove. Marshall R. Pugh. Brief illustrated description. 1000 w. Eng Rec—Sept. 6, 1913. No. 45000.

Methods and Cost of Sanitary Sewer Construction at Davenport, Ia. W. S. Anderson. Describes construction methods and records costs. 3000 w. Engng & Con—Sept. 3, 1913. No. 44978.

Comparative Merits of Separate and Combined Sewers, with Special Reference to Requirements Imposed by Sewage Treatment. Extract from a paper by John H. Gregory, read before the Am. Soc. of Munic. Imp. 3500 w. Engng & Con—Oct. 15, 1913. No. 45890.

Greater Vancouver Joint-Sewerage Scheme. An account of the organizing and financing project for draining 55600 acres, with data on rainfall and float tests. Ills. 2500 w. Eng Rec—Oct. 25, 1913. No. 46211.

The Passaic Valley Sewer. Illustrates and describes some of the work in progress and the plans for securing wide diffusion at the outlet in New York bay. 1200 w. Sci Am—Oct. 25, 1913. No. 46136.

See also Sewerage Systems, and Storm Sewers, under *Municipal*.

Sewer Screens

Revolving Drum Screens for Sewage. Data compiled from articles in German technical periodicals by Kenneth Allen. Ills. 3000 w. Eng Rec—April 26, 1913. No. 41541.

Sewer Systems

The Design of and Methods and Cost of Construction, by Force Account and Piece Work, a Sewerage System for a Small Town. J. E. Tupper. Explains conditions at Pomeroy, Wash., describing the sewerage system, its construction, cost, etc. 7000 w. Engng & Con—March 12, 1913. No. 40454.

Smoke

How and Why Smoke Is Injurious. Raymond C. Brenner. Considers the nature and composition of soot, its effect on vegetation, buildings, materials, etc. 1800 w. Met & Chem Engng—Nov., 1912. No. 37253 C.

Industrial Research, With Especial Reference to the Problems of the Smoke Nuisance. Dr. Raymond F. Bacon. Outlines the method of research founded by Robert Kennedy Duncan, and some of the problems studied. 4000 w. Jour Worcester Poly Inst—Nov., 1912. No. 37883 C.

The Laws in Force in Europe Against the Emission of Black Smoke. John B. C. Kershaw. Reviews the legal position

Smoke

in regard to smoke abatement in Great Britain, and proposed amendments, also the state of the law in Paris, Germany and Austria. 3500 w. *Met & Chem Engng*—Nov., 1912. No. 37256 C.

City Smoke Ordinances and Smoke Abatement. Samuel B. Flagg. Information concerning the status of smoke abatement in the United States, and what are believed to be the better methods. 55 pp. U S Bureau of Mines—Bul. 49. No. 38655 N.

Laboratory on Wheels. Hugh Pattison. Illustrates and describes a laboratory used in atmospheric tests by smoke abatement experts. 2000 w. *Munic Engng*—Dec., 1912. No. 38647 C.

City Smoke Ordinances and Smoke Abatement. Samuel B. Flagg. A study of the factors affecting smoke conditions in cities, smoke-abatement work in the United States, the function of a smoke ordinance, the enforcement, etc. 18500 w. U S Bureau of Mines—Bul. 49. No. 39507 N.

Why Smoke Is an Industrial Nuisance. R. C. Benner. Discusses what smoke costs in damage to property, affect on vegetation and health, etc. 3500 w. *Ir Age*—Jan. 9, 1913. No. 38915 C.

Smoke and Dust Precipitation. Reviews experiments of Prof. W. W. Strong, of Pittsburgh University, and some of the more important conclusions. 3000 w. *Elec Rev, Lond*—Jan. 17, 1913. No. 39457 A.

Smoke Abatement and Ordinances. Comparison of present conditions in principal cities of the United States. 3000 w. *Eng Rec*—Feb. 8, 1913. No. 39728.

Methods and Means of Smoke Abatement. O. R. McBride. Discusses the principal features of the smoke problem, showing that it can be solved. 4500 w. *Pro Engrs' Club of Phila*—Jan., 1913. No. 39959 D.

Atmospheric Pollution: A Standard Method of Measuring Its Amount and Character. John B. C. Kershaw. An account of the steps taken to secure a standard method; methods that have been suggested or tried, with some preliminary results. 2800 w. *Surveyor*—March 14, 1913. No. 40814 A.

Regulating Smoke on River Steamboats Within City Limits. Reports investigations made by a committee at Cincinnati, and discusses the questions involved. 1500 w. *Eng Rec*—March 1, 1913. No. 40261.

A Curse of Civilization. Sir William Richmond. Read at conference on "Coal Smoke Abatement." Discusses the damages caused by smoke and the possibility

MUNICIPAL

of its abatement. 3000 w. *Archit, Lond*—Oct. 10, 1913. No. 45964 A.

See also Smoke Prevention, under MECHANICAL ENGINEERING, *Steam Engineering*.

Storm Sewers

The Garrison Creek Storm Overflow Sewer in the City of Toronto. Ray R. Knight. Illustrates and describes the design of this relief sewer. 1200 w. *Can Engr*—March 20, 1913. No. 40781.

A Brief Discussion of Rainfall and Its Run-off into Sewers. Samuel A. Greeley. Deals with the determination of storm run-off for the computation of adequate sizes of sewers. 6000 w. *Jour W Soc of Engrs*—Sept, 1913. No. 46289 D.

Discussion of Papers by Messrs. Thon, Howson, and Greeley. 4800 w. *Jour W Soc of Engrs*—Sept, 1913. No. 46290 D.

Storm Water

Storm Water Discharge. R. O. Wynne-Roberts and T. Brockmann. First of a series of articles explaining the factors that affect this problem, and describing a more accurate method of calculation than that in use. 1500 w. *Can Engr*—Feb. 3, 1913. Serial, 1st part. No. 39827.

Storm Water Discharge. R. O. Wynne-Roberts and T. Brockmann. First of a series of articles dealing in detail with the factors involved. 1000 w. *Surveyor*—March 28, 1913. Serial. 1st part. No. 41136 A.

Town Planning

The Principles to Be Observed in Designing and Laying Out Towns Treated from the Architectural Standpoint. T. Harold Hughes. An illustrated study of the aims and problems. 8800 w. *Jour Roy Inst of Brit Archts*—Dec. 7, 1912. Serial. 1st part. No. 39177 D.

Town Planning and Civic Improvement. C. H. Mitchell. Discusses the planning for circulation and transportation; for open spaces and parks; privately owned land, and land outside the city, giving recommendations. 6500 w. *Can Engr*—Dec. 26, 1912. No. 38688.

Town Planning. Christopher J. Yorath. Extract from a paper read at Convention of the Union of Can. Municipalities. Discusses the problem under eight heads. 3500 w. *Can Engr*—Aug. 28, 1913. No. 44868.

Legal Aspects of Town Planning. John L. Jack. Considers the subject in reference to Scotland. 4000 w. *Surveyor*—Aug. 22, 1913. No. 44910 A.

The Birmingham Town Planning Schemes and Notes on the Procedure Regulations. Henry E. Stilgoe. Outline

Town Planning

the various schemes. Also discussion. Ills. 6500 w. Surveyor—Aug. 29, 1913. No. 45034 A.

Scientific Methods for Constructing a Healthful Town (Les méthodes scientifiques pour la construction des villes salubres). Aug. Rey. Views on orientation, industrial quarters, land speculation and habitation limits. 2000 w. Mem Soc Ing Civ de France—June, 1913. No. 45300 G.

See also Housing under *Municipal*.

ROADS AND PAVEMENTS

Asphalt

Waste

The Collection and Disposal of Municipal Waste. G. H. Herrold. Discusses methods and plants of various cities. 4000 w. Jour Assn of Engng Soc—April, 1913. No. 41288 C.

Disposal of Paper Mill Wastes. Edward Hutchins. Gives a summary of the wastes to be handled, their characteristics and principal methods of treatment, with brief description of a plant. 8500 w. Jour Assn of Engng Socs—May, 1913. No. 42438 C.

ROADS AND PAVEMENTS

Accounting

Accounting System for Road Expenditures. W. W. Crosby. Gives the classification adopted by the Maryland Roads Commission. 2000 w. Eng Rec—Dec. 28, 1912. No. 38576.

Administration

Road Administration. W. A. McLean. Read before the Int. Road Cong. Considers the work as a business enterprise. 3000 w. Con Rec—Aug. 20, 1913. No. 44556.

Asphalt

History of Fifth Avenue Asphalt Pavement, New York. Clifford Richardson. Gives data showing that the modern type of sheet asphalt surface will stand traffic of the most trying sort. 2500 w. Eng Rec—Jan. 4, 1913. No. 38803.

Asphaltic Concrete and Sheet Asphalt Pavements. Gives specifications adopted by Vancouver, B. C. 3500 w. Can Engr Feb. 20, 1913. No. 39973.

Street and Railway Track Paving with Asphalt Block in a Suburban Town. Frank Chappell. Read before the Can. Soc. of Civ. Engrs. Explains conditions in the town of Oshawa and describes the construction of asphalt block pavement on a concrete base. 3000 w. Can Engr—Feb. 20, 1913. No. 39971.

Asphalt Street Pavements. Ernest Worrall. Extracts from a paper read at a meeting of the Inst. of Munic. & Co. Engrs. at Stretford, Eng. Gives part of specifications and information concerning work in Stretford. 2800 w. Surveyor—March 14, 1913. No. 40815 A.

Paving in Salt Lake City. D. H. Blossom. Discusses the sheet asphalt pavement, the bitulithic and natural rock asphalt. Ills. 3500 w. Jour Assn of Engng Socs—March, 1913. No. 40433 C.

Tests on Compressed Asphalt Material (Esperienze sui materiali per asfalto compresso). L. Torri. Results of tests conducted at the Milan laboratory for

testing street materials. 3000 w. Monit. Tec—Jan. 20, 1913. No. 40616 D.

How to Repair Asphalt Pavements. W. L. Hempelmann. Brief directions. Ills. 1000 w. Munic Engng—April, 1913. No. 41607 C.

Cost of Asphalt Repairs. Abstracts of reports of the operation of municipal plants for the repair of streets for 1912 in various cities. Ills. 2500 w. Munic Engng—May, 1913. No. 42411 C.

Highway Construction with Paint Binder and Its Sheet Asphalt Surface. Description, abstracted from an article by A. E. Loder, of a type of construction used in California. 1200 w. Engng & Con—May 28, 1913. No. 42514.

Maintenance of Asphalt Pavements. Francis P. Smith. Discusses defects due to wear and tear of traffic, deterioration of bituminous material, and defects in construction. Repairing by cutting out and by surface heating. 2500 w. Munic Jour—May 15, 1913. Serial. 1st part. No. 42085.

The Rock Asphalt Pavements of Lawton, Okla. Frank B. King. Gives the specifications and description of work. Ills. 2000 w. Engng & Con—April 30, 1913. No. 41818.

Method and Cost of Asphaltic-Macadam Construction on the Boulevard System of Kansas City, Mo. C. W. Redpath. Illustrated description of methods and results, with costs. 3500 w. Engng & Con—May 21, 1913. No. 42307.

A Rational Formula for Asphalt Street Surfaces. J. Alden Griffin. Gives a modification of the formula by the late Andrew Rosewater. Ills. 500 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44782 F.

Asphalt Paving Cements and Road Binders. J. W. Howard. States the necessary qualities and gives laboratory methods for determining them. 4500 w. Eng Rec—Sept. 27, 1913. No. 45476.

Consult Classification of the Index. See page 9.

Asphalt Block

See also Asphalt Plant, under *Materials of Construction*.

Asphalt Block

Street and Railway Track Paving with Asphalt Block in a Suburban Town. Frank Chappell. Illustrated description of work at Oshawa, Ontario. 2500 w. Can Soc of Civ Engrs—Feb. 6, 1913. No. 41709 N.

Asphaltic Concrete

Asphaltic Concrete as a Paving Material for Residence Streets, Suburban Districts and Boulevards. Linn White. Reviews briefly the principal varieties of street pavement used and gives information concerning the varieties of asphaltic concrete. 3500 w. Jour Assn of Engng Soc—June, 1913. No. 43246 C.

Asphaltic Concrete as a Paving Material. Linn White. Considered especially with reference to residence streets, suburban districts and boulevards. 4500 w. Can Engr—Aug. 7, 1913. No. 44280.

Asphalt Plant

St. Louis Municipal Asphalt Plant. Harry M. Crutcher. Brief illustrated description of a plant used for repair and maintenance work only. 2000 w. Munic Jour—Nov. 21 1912. No. 37767.

Municipal Asphalt Plants: Cost of Operation and Estimates for the Establishment of a Plant for the District of Columbia. From the report of David E. McComb, giving results of an investigation of the desirability and cost. 8000 w. Engng & Con—March 5, 1913. No. 40344.

Municipal Asphalt Plants of St. Louis, Mo. Description and costs of operation. Ills. 1800 w. Munic Engng—Oct, 1913. No. 46145 C.

Australasia

Australasian Road Problems. J. M. Coane. Paper for the Int. Road Cong. Explains conditions and the difficulties. 2000 w. Surveyor—Oct. 3, 1913. No. 45848 A.

Baltimore

The Paving Problem in Baltimore. L. J. Houston. An account of the methods and work of the Paving Commission for handling the improved paving situation. 3000 w. Cornell Civ Engr—Nov., 1912. No. 37538 C.

Belgian Block

An Oak-Keyed Belgian Block Pavement. Illustrated description of an invention by Edward Alcott for making use of old worn blocks in constructing a comparatively noiseless pavement. 900 w. Eng News—Sept. 25, 1913. No. 45489.

Bends

Superelevation at Bends in Roads. Reginald Ryves. Discusses the limits of its

ROADS AND PAVEMENTS**Bituminous**

safe and useful employment. 2500 w. Surveyor—May 25, 1913. No. 42748 A.

Bituminous

Some Causes of Failure in the Construction of Road Surfaces With Bituminous Materials. Abstract of Prof. Arthur H. Blanchard's paper before the Am. Road Cong. Explains the various methods of using bituminous materials discussing causes of failure due to conditions, materials, and construction. 2500 w. Engng & Con—Nov. 13, 1912. No. 37564.

Bitumin in Modern Pavements. J. B. Temple. Explains the nature and occurrence of bitumen, its applications to highways, etc. 3500 w. Ap Sci—Nov., 1912. Serial. 1st part. No. 38285 C.

Bituminous Materials: Their Use and Misuse. C. S. Reeves. Abstract of a paper read before the Mich. Engng. Soc. Considers the methods of application from the standpoint both of surface treatment and construction, pointing out some causes of failure. 2500 w. Engng & Con—Feb. 12, 1913. No. 39830.

Fixed Carbon in Bituminous Materials: Its Determination and Value in Specifications. Lester Kirschbraun. Read before the Am. Assn. for the Adv. of Science. Discussion showing in what particulars the fixed carbon test is of value. 4000 w. Engng & Con—Feb. 12, 1913. No. 39831.

The Consistency of Bituminous Material—Its Determination and Value in Specifications. W. W. Crosby. Read before the Am. Assn. for the Adv. of Science. A practical discussion of the significance and viscosity of bituminous materials for road work. 5000 w. Engng & Con—Feb. 5, 1913. No. 39696.

Bituminous Gravel Concrete Pavements. Information from a paper by Spencer J. Stewart, read before the Am. Assn. for the Adv. of Science. Describes the method of construction. Ills. 1500 w. Engng & Con—Feb. 5, 1913. No. 39692.

Bituminous Gravel Concrete Pavements. J. W. Howard. Gives reasons for failures of such road surfaces. 1000 w. Munic Jour—June 19, 1913. No. 42967.

Bituminous Resurfacing by the Illinois Highway Commission in 1912. Date abstracted from a recently issued report showing the cost of resurfacing work. 3000 w. Engng & Con—June 4, 1913. No. 42661.

Modern Bituminous Roads and Pavements. F. C. Ford. Considers types of construction in which bituminous materials are used. 5000 w. Chem Engr—July, 1913. No. 43855 C.

Bituminous Surfaces and Bituminous Pavements. A. H. Blanchard. Read at

Consult Classification of the Index. See page 9.

Brick

ROADS AND PAVEMENTS

Concrete

the Int. Road Cong. Considers bituminous concrete pavements used in the United States during the past three years. 3000 w. Con Rec—Aug. 20, 1913. No. 44554.

Bituminous Pavements for City Streets. George W. Tillson. A discussion of the bituminous pavements considered standard to-day, their construction, maintenance and repair. General discussion. 10000 w. Pro Am Road Bldrs Assn—1913. No. 46162 N.

Methods of Bituminous Construction. S. D. Foster. Read before the Am. Road Cong. Considers the penetration method as specified by the Pennsylvania State Highway Department. The selection of materials the governing factor. 2500 w. Con Rec—Oct. 8, 1913. No. 45792.

Brick

Brick Street Paving. Will P. Blair. Discusses the essentials involved in the most approved methods of constructing brick pavements, with special reference to Cleveland, O. 2500 w. Jour Cleveland Engng Soc—Nov., 1912. No. 37545 D.

Temperature Strains in Brick Pavements. James E. Howard. Describes methods of investigations made by the U. S. Bureau of Standards, and gives results. Ills. 2000 w. Munic Engng—Dec., 1912. No. 38648 C.

Thermal Effects on Cement-Filled Brick Pavements. James G. Howard. Read at Dallas, before the Am. Soc. of Munic. Imp. Reports tests made under service conditions. Ills. 4500 w. Engng & Con—Nov. 27, 1912. No. 37921.

The Testing of Vitrified Paving Brick. W. P. Blocher. Reviews the tests so far devised, favoring the rattler test. 1200 w. Wis Engng—Nov., 1912. No. 38566 C.

Method and Cost of Brick Paved Country Road Construction in New York State. Illustrated description of methods employed, from a paper by William C. Perkins, read before the Am. Assn. for the Adv. of Science. 1500 w. Engng. & Con—Feb. 19, 1913. No. 39930.

Brick on Country Roads. William C. Perkins. Read before the Am. Assn. for the Adv. of Science. Illustrated report of the use of brick in the vicinity of Buffalo. 2500 w. Munic Engng—Feb., 1913. No. 40098 C.

Prevention of Defects in Brick Pavements. Illustrated discussion of defects, the causes and prevention. 2500 w. Munic Engng—Feb., 1913. No. 40097 C.

Relative Advantages of Laying Brick Pavements on Sand Foundation and Cement Concrete Foundations. Abstract of a paper by Robert Hoffman, read before the Am. Assn. for the Adv. of

Science. Discusses the advantages as regards cost, maintenance and life. 1800 w. Engng & Con—Feb. 26, 1913. No. 40226.

Sand vs. Concrete Foundations for Brick Pavements. Robert Hoffman. Abstract of paper read before the Am. Assn. for the Adv. of Sci. Discusses the relative economy. Ills. 2500 w. Munic Jour & Engr—March 6, 1913. No. 40375.

Brick Pavements (Klinkerbestratin-gen). F. C. J. van den Steen van Ommen. Studies on twelve brick sections, the tests applied, and directions for best results in laying, as practiced in Holland. Ills. 24,700 w. De Ingenieur—April 26, 1913. No. 42164 D.

Vitrified Brick as a Paving Material for Country Roads. Vernon M. Peirce and Charles H. Moorefield. Information relating to the construction of brick roads and suggestions for preparing specifications for satisfactory work. Ills. 34 pp. Bul U S Dept of Agri—No. 23. No. 45409 N.

Experiments in Brick Road Construction. James T. Voshell. Gives test data and costs of section containing fourteen varieties of paving brick. 1500 w. Eng Rec—Sept. 27, 1913. No. 45477.

Ohio Heavy Traffic Brick. Illustrates and describes the construction of high quality brick roads, and other kinds of pavement. 3500 w. Munic Jour—Sept. 25, 1913. No. 45485.

The Brick Roads of Cuyahoga Co., Ohio. James M. McCleary. Read before the Am. Road Cong. Shows that success depends on care in details of construction. 3000 w. Eng News—Oct. 16, 1913. No. 45932.

See also Paving Tests, under Roads and Pavements.

By-Pass

By-Pass Roads. Reginald Ryves. A discussion of the principles which should govern their alignment and construction. 3500 w. Surveyor—May 30, 1913. No. 42770 A.

California

California State Roads. S. J. Van Ornum. A critical discussion of the types of construction. Ills. 2500 w. W Engng—July, 1913. No. 44048 C.

Concrete

The Construction of Concrete Highways. Abstract of A. N. Johnson's paper, read before the Am. Road Cong. Discusses the mixture, aggregate, action under temperature, changes, expansion joints, and other features. 5000 w. Engng & Con—Nov. 13, 1912. No. 37562.

Concrete Highway Construction. A.

Consult Classification of the Index. See page 9.

Concrete

ROADS AND PAVEMENTS

Concrete

N. Johnson. Read at Am. Road Cong. Detailed discussion of the characteristics of such roads and of methods of construction. 5500 w. Concrete-Cement-Age—Dec., 1912. No. 38154.

Concrete Construction of the Watertown Plank Road, Wisconsin. H. J. Kueling. Drawings and description of the work. 1200 w. Eng News—Dec. 26, 1912. No. 38587.

Brantford Concrete Pavements. T. Harry Jones. Illustrated detailed description of satisfactory concrete pavements. 1500 w. Can Engr—Dec. 5, 1912. No. 38088.

Concrete Pavement in Davenport and Vicinity. A. M. Compton. An account of the concrete pavements laid and the specifications used. 2000 w. Concrete-Cement Age—Dec., 1912. No. 38155.

Method and Cost of Constructing a Granitoid Pavement in Pierce County, Washington. C. H. Sweetser. Illustrated description of the work with itemized costs. 1800 w. Engng & Con—Feb. 5, 1913. No. 39691.

Riverbank Experimental Road. Illustrated description of construction methods, materials and tests of an experimental concrete road in California. 1200 w. Eng Rec—March 8, 1913. No. 40367.

Concrete Roads. Edward N. Hines. Information concerning the construction and maintenance of concrete roads, giving results of comparative tests. Discussion. Ills. 13500 w. Jour W Soc of Engrs—March, 1913. No. 41270 D.

Concrete Pavements for City Streets and Country Roads. J. H. Chubb. Discusses the effect of motor traffic on roads and the advantages of concrete pavement for present day demands. 6500 w. Indiana Engng Soc—1912. No. 41733 N.

The Concrete Roads of Wayne County. Edward M. Hines. Read before the Nat. Assn. of Cement Users. Discusses the good points in favor of this construction and gives interesting information. 3000 w. Cement—Dec., 1912. No. 41151 C.

Asphaltic Concrete in Queens Borough. Describes method of construction, using old macadam as foundation. Ills. 2500 w. Munic Jour—May 1, 1913. No. 41857.

Chevy Chase Experimental Concrete Road. Illustrates and describes bituminous, oil-cement and plain-cement concrete highway pavement laid near Washington, D. C. 2000 w. Eng Rec—June 28, 1913. No. 43304.

Concrete Pavement Construction. Presents a system of design to be used as a guide in determining a correct thickness. 3500 w. Munic Engrg—July, 1913. No. 44033 C.

Concrete Pavements and Correct Methods of Their Construction. S. T. Morse and W. D. P. Warren. Outlines correct methods of construction of concrete pavements. 3000 w. Engng & Con—July 9, 1913. No. 43607.

Plain Concrete Paving Used in Kansas City, Mo. Clark R. Mandigo. Describes the construction of these pavements and comments on the wear and utility. Ills. 3000 w. Eng News—July 17, 1913. No. 43838.

Winona County Concrete Roads. Describes the construction, in Minnesota, of 16 miles of 8-ft. concrete roads with macadam shoulders. Ills. 1500 w. Eng Rec—Aug. 9, 1913. No. 44242.

Bituminous Concrete Pavements. William B. Spencer. Considers types of mixed bituminous pavements and their construction. 4500 w. Jour Am Soc of Engng Con—June, 1913. No. 45163 C.

Hard Roads in Wayne County, Michigan. Illustrated account of the construction of eighty miles of concrete roads leading out of Detroit. 3000 w. Eng Rec—Sept. 27, 1913. No. 45475.

Some New York State Concrete Roads. Notes on completed and uncompleted work. Ills. 2500 w. Concrete-Cement Age—Sept., 1913. No. 45249.

A Report on the Use of Concrete as a Paving Material. Report of an investigation of the service given by concrete pavements. Also editorial. 7500 w. Engng & Con—Oct. 1, 1913. No. 45623.

Concrete as a Road Material. E. S. Hanson. Introductory chapter of a new volume on "Concrete Roads and Pavements." Discusses the qualities of a good roadway and the advantages of concrete. 3500 w. Cement Era—Oct., 1913. No. 45874.

Service Records of Concrete Pavement with Critical Suggestions for Obtaining Improved Service. Abstract of paper by F. F. Rogers, and discussion, before the Am. Road Cong. An official service study of the concrete roads in Wayne Co., Mich. 6000 w. Engng & Con—Oct. 22, 1913. No. 46128.

Concrete Roads Near Philadelphia. George D. Steele. Illustrates and describes the construction of these roads and gives specifications. 3500 w. Cement Era—Oct., 1913. No. 45875.

The Concrete Roads of Wayne County, Mich. Frank F. Rogers. Read before the Am. Road Cong. Gives traffic records and discussion of defects appearing, and other information relating to these roads. 3500 w. Eng News—Oct. 9, 1913. No. 45802.

See also Paving Tests, under *Roads and Pavements*.

Consult Classification of the Index. See page 9.

Concrete Costs

ROADS AND PAVEMENTS

Driveways

Concrete Costs

Methods and Labor Costs of Concrete Pavement Construction at Davenport, Ia., by Hand Mixing and by Machine Mixing. W. S. Anderson. Describes pavement laid by contract during the summer of 1911 and 1912. 3800 w. Engng & Con—Dec. 25, 1912. No. 38549.

Construction

Road Construction. E. A. Kingsley. From an address before the State Good Roads Assn., Little Rock, Ark. Discusses details of construction and location. 2000 w. Mfrs Rec—Feb. 6, 1913. No. 39664.

Road Construction. From W. A. McLean's report to the government concerning the roads of Ontario. 3500 w. Can Engr—March 20, 1913. No. 40782.

Earth and Gravel Roads. Robert C. Terrell. From a paper read before the Am. Road Bldrs. Assn. Discusses the importance of good drainage and proper location, crowning, etc. 2000 w. Can Engr—March 13, 1913. No. 40679.

Road Construction and Maintenance from the Standpoint of the Motor User. Richard W. R. Twelvetees. Comments on features characterizing highways, such as approaches to towns and villages, sharp bends and concealed turnings, super-elevation at curves, etc. Ills. 3500 w. Surveyor—March 28, 1913. No. 41137 A.

The Making of Good Roads. W. B. Dunbar. The advantages of good roads are discussed and features of construction, materials, and earth, gravel, and macadam roads. Ills. 5500 w. Ap Sci—April, 1913. No. 42359 C.

The Trend of Modern Road Construction. From a paper by Col. Crompton and Mr. Boulnois read before the Roads Imp. Assn., London. Discusses wheel widths, interstitial wear, the ideal road, etc. General discussion. 4000 w. Surveyor, June 27, 1913. No. 43633 A.

Road Construction and Maintenance—Present and Future. Hector F. Gullan. Read before the Inst. of Munic. & Co. Engrs. Discusses the road surfaces most generally used, road construction, paving, &c., giving statistics. Discussion. 5500 w. Surveyor—July 25, 1913. No. 44174 A.

Road Construction and Maintenance Under Modern Traffic. W. J. Hadfield. Read before the Inst. of Munic. & Co. Engrs. Considers various kinds of pavement and the behavior under heavy traffic. Also discussion. 8000 w. Surveyor—Aug. 1, 1913. No. 44312 A.

Road Construction and Maintenance. An informal discussion at meeting held June 17 and 18, 1913. Ills. 30500 w.

Pro Am Soc of Civ Engrs—Sept., 1913. No. 45529 F.

Street and Pavement Construction. A. F. Macallum. Considers various pavements in use and their characteristics. 3500 w. Can Engr—Sept. 4, 1913. No. 44959.

The Problem of Economic Road Construction. Editorial discussion of road construction and maintenance and what can be done to improve conditions and lessen cost. 4000 w. Eng News—Sept. 25, 1913. No. 45490.

The Economics of Highway Construction. Clifford Richardson. Considers the manner of financing road construction. Discussion. 5000 w. Pro Am Road Bldrs Assn—1913. No. 46171 N.

The Contractor's Point of View. Hugh Murphy. Explains some of the problems that cause friction and trouble and gives suggestions. General discussion. 10800 w. Pro Am Road Bldrs Assn—1913. No. 46166 N.

See also Road Models and Surfacing, under *Roads and Pavements*.

Contract Law

Legal Suggestions of Importance to Road Contractors. Abstract of a paper by William L. Bowman, read before the Third Am. Road Cong. Discusses important phases of contract law and rules to be heeded. 5500 w. Engng & Con—Oct. 15, 1913. No. 45887.

Contracts

Problems of a Highway Contractor. Hugh Murphy. Read before the Am. Road Bldrs. Assn., at Cincinnati, O. Discusses the causes of friction between contractors and officials, and the remedies. 3500 w. Eng Rec—Dec. 21, 1912. No. 38325.

Convict Labor

Convict Labor in Highway Construction. From a paper by Joseph Hyde Pratt, read at London meeting of the Int. Road Cong. Observations on the use of this class of labor. 2500 w. Engng & Con—July 9, 1913. No. 43608.

Culverts

See same heading, under *Bridges*.

Cuts

Cuts in Newly Paved Streets. James E. Barlow. Considers preventive measures and the proper control and restoration of necessary openings. General discussion. 2200 w. Pro Am Road Bldrs Assn—1913. No. 46164 N.

Driveways

Park Drives and Boulevards. Linn White. Deals particularly with Chicago driveways. Ills. 2200 w. Munic Engng—Feb., 1913. No. 40096 C.

Consult Classification of the Index. See page 9.

Dust Prevention**Dust Prevention**

Progress Report of Experiments in Dust Prevention and Road Preservation, 1911. Gives details of methods pursued, with cost data and analyses of the materials used. 13800 w. U S Dept of Agri, Circ. 98—Dec. 12, 1912. No. 39508 N.

Dust Prevention in St. Paul. G. H. Herrold. Describes methods of sprinkling and oiling streets, giving cost, etc. 2500 w. Munic Jour—Jan. 2, 1913. No. 38786.

Progress Reports of Experiments in Dust Prevention and Road Preservation, 1912. Annual review prepared by the Office of Public Roads. 51 pp. U. S. Dept. of Agri—Circ. 99. No. 43618 N.

Experimental Work in Dust Prevention and Road Preservation in 1912 by the U. S. Office of Public Roads. Description of experimental work, taken from a recently issued circular. 8500 w. Engng & Con—July 30, 1913. No. 44049.

Sprinkling and Oiling Streets, St. Paul, Minn.; Organization, Methods, Cost, and Method of Assessing Cost. Based on the 1912 annual report of the Commissioner of Public Works. 3000 w. Eng News—Aug. 14, 1913. No. 44371.

Earth Roads

Unsurfaced Roads. W. S. Keller. Read before the Detroit Road Cong. Discusses unsurfaced roads under three classes, their construction and maintenance. 1700 w. Mfrs' Rec—Oct. 2, 1913. No. 45622.

Education

Highway Engineering Education. W. W. Crosby. Critical discussion of defects observed in the education of engineering employees. 2800 w. Bul Soc for Pro of Engng Ed—May, 1913. No. 44825 N.

Engineering

Permanent Roads an Economic Necessity. Harry Wilkin Perry. Discusses waste due to poor road engineering, and the results of good practice. Ills. 2500 w. Sci Am Sup—Sept. 13, 1913. No. 45064.

Equipment

Plant Equipment for Road Construction. F. E. Ellis. Discussion of the question of plant equipment from the standpoint of a road contractor, pointing out the importance of making proper plant changes. 2200 w. Engng & Con—Dec. 11, 1912. No. 38144.

Plant Equipment. F. E. Ellis. Information concerning the kind and amount of equipment required for different classes of roads given from the writer's experience. 3000 w. Pro Am Road

ROADS AND PAVEMENTS**Flood Effects**

Bldrs Assn—1913. No. 46167 N.

Earth and Gravel Roads. Robert C. Terrell. Drainage and its importance is considered, the proper location of roads, construction, maintenance and related topics. General discussion. 4500 w. Pro Am Road Bldrs Assn—1913. No. 46169 N.

Europe

Europe's Good Roads. Francis Mil-toun. Illustrated review of the best road engineering practice of Europe. 3000 w. Sci Am—Jan. 11, 1913. No. 39103.

The Highways of Europe. Arthur H. Blanchard. Discusses their administration, construction and maintenance. Ills. 4000 w. Con Rec—April 30, 1913. No. 42070.

European Paving

Observations on European Paving Methods and Materials. Extracts from a paper by E. H. Thomas, giving information collected during a recent trip of inspection of roads and pavements in several countries. 3500 w. Engng & Con—Oct. 29, 1913. No. 46383.

European Roads

European Road Building. Clarence A. Kenyon. Information on the construction and maintenance of European roads. 2000 w. Munic Engng—Aug., 1913. No. 44390 C.

Excavation

Paving Earthwork Computations. F. C. Snow. Gives diagrams used for computing volume of excavation for street paving, using various forms of field notes. 1000 w. Munic Jour—June 19, 1913. No. 42968.

Experimental Pavements

Service Test of Street Pavements Under City Traffic. Report concerning experimental pavements laid on Second Ave., New York City. 2000 w. Engng & Con—Feb. 19, 1913. No. 39931.

Experimental Roads

United States Government Experimental Road. Gives construction notes and cost data on concrete road work at Chevy Chase, Md. Ills. 3300 w. Concrete-Cement Age—Sept., 1913. No. 45248.

Chevy Chase Experimental Road. Illustrated account of this government built road of different materials laid in various ways. Deals especially with the concrete construction. 1800 w. Cement Era—Oct, 1913. No. 45873.

Flood Effects

Effects of Flood on Pavements and Sewers. Gaylord C. Cummin. Notes on the damage and repair of municipal works at Dayton. Ills. 1500 w. Eng Rec—Sept. 27, 1913. No. 45479.

Consult Classification of the Index. See page 9.

France

ROADS AND PAVEMENTS

Inspection

France

Authorities in Charge of the Construction and Maintenance of the Highway System of France. Describes the organization having charge. Abstracted from report of E. Marion, presented at the Third Int. Road Cong. 3500 w. Engng & Con—Sept. 10, 1913. No. 45059.

Germany

The Management of Roads in Germany. Gives an account of administrative arrangements in certain provinces; and developments from 1905-1910. 2800 w. Surveyor—Feb. 21, 1913. No. 40311 A.

Good Roads

Good Roads. Addresses by Hon. Henry W. Kiel and by Hon. John M. Chamberlin. 4500 w. Pro St. Louis Ry Club—Sept. 12, 1913. No. 46103.

Grades

Grade and Surface Required on Roads. Reports tests made with a traction dynamometer wagon. 2000 w. Munic Engng—Jan., 1913. No. 39536 C.

See Traction, under *Roads and Pavements*.

Granite Block

Small Granite-Block Pavement in Navy Yard at Brooklyn. Illustrated description of the construction of a pavement similar to the Durax block pavement of England. 1200 w. Eng Rec—Aug. 16, 1913. No. 44428.

Highways

Maintenance and Repair of New York State Highways in 1911, and a Progress Report on Experimental Work. Notes on the work done by the Bureau of Maintenance and Repair during the year 1911. 2500 w. Engng & Con—Nov. 20, 1912. No. 37701.

Revelations Concerning New York State Highway Work. Editorial criticism of the work, and review of statement made by C. Gordon Reel, and Gov. Sulzer's remarks. 3500 w. Eng News—Jan. 9, 1913. No. 38951.

New York State Highway Work. Describes materials, appliances and methods used in various districts. Ills. 3000 w. Munic Jour—Sept. 25, 1913. No. 45484.

Highways of New York State. George A. Ricker. Discusses the legal, financial and engineering considerations in expending the \$100,000,000 voted for road building. 2500 w. Eng Rec—Oct. 4, 1913. No. 45673.

County and Town Organization of Highway work. A. N. Johnson. Abstract of a paper before the Am. Road Bldrs. Assn. Outlines the duties of the commission, the working force, road machinery,

construction work, maintenance, etc. 2000 w. Eng News—Jan. 9, 1913. No. 38946.

King Edward VII Highway. H. S. Van Scoyoe. Detailed description of the methods used in constructing the concrete portion of this highway which extends from Montreal, Que., to Rouse's Point, N. Y. 1000 w. Can Engng—Jan. 23, 1913. No. 39409.

Highway Administration in the United States. Explains the systems in operation in the different states. 4000 w. Surveyor—Feb. 28, 1913. Serial, 1st part. No. 40475 A.

State Highways. A. E. Robinson. Compares administration methods of construction of highways in Idaho with methods in older States. 2500 w. Jour of Idaho Soc of Engrs—June, 1912. No. 41724 N.

Work of the Philadelphia Bureau of Highways. Portions of the annual report dealing with reorganization of staff and progress. Ills. 2500 w. Eng Rec—June 7, 1913. No. 42712.

Constituent Principles of Highway Maintenance. Analytical discussion, by Dr. L. I. Hewes, of the economics of highway administration. 3000 w. Eng Rec—July 19, 1913. No. 43790.

I. Organization of a State Highway Department. W. W. Crosby. II. The Organization of a Highway Department for a Large City. William H. Connell. III. County and Township Organization of Highway Work. A. N. Johnson. Three papers discussed together. 19500 w. Pro Am Road Bldrs Assn—1913. No. 46161 N.

The Development of a Plan for a State Road System. James R. Marker. Reviews briefly the various eras of highway travel in the United States, discussing particularly conditions in Ohio. General discussion. 6000 w. Pro Am Road Bldrs. Assn—1913. No. 46165 N.

Inspection

Instructions of the Bureau of Highways, Manhattan Borough, New York City, for the Guidance of Its Inspectors of Street Paving. Gives instructions recently issued by the Commissioner of Public Works. 7500 w. Engng & Con—April 2, 1913. No. 41023.

General Instructions to Inspectors of Street Paving. Abstract of instructions recently issued by the Bureau of Highways of the Borough of Manhattan, N. Y. City. 3000 w. Eng News—May 29, 1913. No. 42562.

Instructions of the Bureau of Highways, Queens Borough, N. Y. City, to Inspectors of Highway Improvements. Gives rules and regulations for the street paving inspectors' guidance. 5500 w.

Labor

Engng & Con—June 11, 1913. No. 42796.
Instructions of the Board of Local Improvements, Chicago, Ill., to Its Sub-Inspectors of Paving Work. Also specifications for concrete pavements. 4800 w. Engng & Con—June 25, 1913. No. 43193.

Labor

Labor Problem in Road Construction. P. St. J. Wilson. Read before the Detroit Road Cong. Explains the labor situation in Virginia, and experience with convict labor. 1500 w. Mfrs' Rec—Oct. 2, 1913. No. 45620.

Convict Labor on Road Work. A discussion introduced by Mr. Hill. 5500 w. Pro Am Road Bldrs Assn—1913. No. 46174 N.

Law

Central Road Authorities. Paul D. Sargent. Greater part of a paper read before the Int. Road Cong., London. Traces the development of a few state highway laws and shows the transition from local to centralized control of road offices. 3500 w. Engng & Con—July 9, 1913. No. 43609.

Lighting

Methods of Lighting Public Highways and Vehicles. Abstracts of papers and communications submitted at the Int. Road Congress, with discussion. 5000 w. Surveyor—June 27, 1913. No. 43632 A.

Location

Economics of Highway Location; Formulas and Methods Employed in Locating Roads. Emil Masik. Condensed from an article before the Pub. Road Cong. A study from a European point of view. Considers general direction, alignment, grades, methods, etc. 7500 w. Engng & Con—Oct. 29, 1913. No. 46382.

Louisiana

Louisiana Highways. W. E. Atkinson. Read before the Detroit Road Cong. An account of the road work in progress. 2000 w. Mfrs' Rec—Oct. 2, 1913. No. 45621.

Macadam

A Suggested Improvement in Building Water-Bound Macadam Roads. J. L. Meem. Describes a method of proportioning the rock, which has proved successful. 700 w. Pro Am Soc of Civ Engrs—Dec., 1912. No. 39291 F.

Bituminous Macadam Construction. A. N. Johnson. Details of construction of such roads. 5000 w. Indiana Engng Soc—1912. No. 41732 N.

Conclusions and Cost Data on Macadam Construction in Illinois. Conclusions as to waterbound macadam and bituminous macadam under Illinois conditions, as given in the last annual report of the Commission. 4500 w. Engng & Con—May 28, 1913. No. 42515.

ROADS AND PAVEMENTS**Macadam**

Bituminous Macadam Construction by the Illinois Highway Commission. Description of the apparatus used and methods employed in constructing this type of surfacing, as given in the last annual report. 3000 w. Engng & Con—May 28, 1913. No. 42513.

Some Notes on Macadam Roads and Pavements. Fred L. Macpherson. A discussion of paving materials and their characteristic, and the requirements of modern traffic. 6000 w. Can Engr—July 24, 1913. No. 43907.

The Penetration Method in Macadam Road Construction. W. W. Crosby. Condensed paper as read at the Third Int. Roads Cong. Considers modern American practice in the construction of macadamized roads. 3000 w. Can Engr—July 17, 1913. No. 43826.

Damage to Macadamized Roads by Mechanically Propelled Vehicles. H. T. Wakelam. Calls attention to the damage and the methods of minimizing the destruction. General discussion. 3500 w. Surveyor—Aug. 8, 1913. No. 44450 A.

Macadam Construction with Slag Concrete Binder. Abstract from a report by A. Cornet, presented at the Third Int. Cong. Describes this method of construction. 2000 w. Engng & Con—Aug. 27, 1913. No. 44773.

Tests of Materials Used in Construction of Macadamized Roads. Logan Waller Page. Read at Int. Road Cong. Discusses the mechanical, chemical and physical destructive agencies. 1500 w. Con Rec—Aug. 20, 1913. No. 44555.

Summary of Practice of Various Countries in the Construction of Macadamized Roads Bound with Bituminous, Tarry or Asphaltic Materials. Gives conclusions as adopted by the Third Int. Road Cong. 7800 w. Engng & Con—Sept. 24, 1913. No. 45452.

Some Features of Macadam Construction. T. R. Agg. Discusses water bound macadam and bituminous macadam construction. General discussion. 8800 w. Pro Am Road Bldrs' Assn—1913. No. 46168 N.

Selection of Materials for Macadam Roads. Logan Waller Page. Read at Detroit Road Cong. Discusses methods, with special reference to laboratory tests as an aid. 2800 w. Mfrs' Rec—Oct. 2, 1913. No. 45618.

Treatment of Worn Out and Ravelled Macadam Surfaces. Edmund A. Stevens. Read at Am. Road Cong. Describes the trouble and explains its causes, discussing the remedy. 2000 w. Con Rec—Oct. 8, 1913. No. 45791.

See also Tar-Macadam, under *Roads and Pavements*.

Macadam Material

ROADS AND PAVEMENTS

Oil Storage

Macadam Material

The Petrographic Study of Road Building Rocks in the U. S. Office of Public Roads. E. C. E. Lord. Read before the Am. Assn. for the Adv. of Science. Describes the method of examination of road material for the construction of macadam roads. 2000 w. Engng & Con—Feb. 5, 1913. No. 39693.

Machinery

Evolution of Road-Building Machinery. W. A. McLean. Considers the continuous improvement in design, present tendency toward the use of heavier equipment, etc. 2000 w. Con Rec—April 30, 1913. No. 42072.

Maintenance

Repair and Maintenance of Highways. Laurence J. Hewes. Deals with macadam roads of all kinds, gravel and sand-clay roads, and earth roads. Ills. 71 pp. U S Dept of Agri, Bul 48—May 15, 1913. No. 42497 N.

Modern Road Maintenance. R. Drummond. Read before the Inst. of Munic. & Co. Engrs. Remarks on the development of mechanically propelled traffic, methods of renewal, materials, &c. 2000 w. Surveyor—July 25, 1913. No. 44175 A.

Road Maintenance and Improvement—Present and Future. Harold Collins. Read before the Inst. of Munic. & Co. Engrs. Remarks on the changed conditions, regulation of wheel loads, road construction, &c. General discussion. 4500 w. Surveyor—July 25, 1913. No. 44173 A.

Road Maintenance in Herefordshire. G. H. Jack. Extracts from last annual report, describing methods of treatment. 2000 w. Surveyor—July 25, 1913. No. 44176 A.

The Patch System of Road Maintenance. Gives fundamental rules for this method, taken from a paper by Zdensko Vytvan, read at the Third Int. Road Cong. 2500 w. Engng & Con—Sept. 3, 1913. No. 44976.

See also Construction, under *Roads and Pavements*.

Manitoba

The Road Question in Manitoba. A. McGillivray. Address before the Union of Manitoba Munic. Discusses legislation affecting highways. 2500 w. Can Engr—Jan. 16, 1913. No. 39381.

Maryland

Organization of the Engineering Forces of the State Roads Commission of Maryland. Abstract of a lecture by W. W. Crosby, describing the Maryland engineering organization. 3000 w. Engng & Con—Aug. 20, 1913. No. 44494.

Materials

City Pavements. G. G. Powell. Abstract of a paper read before the Ontario Good Roads Assn. Deals with pavement work in Toronto. 2500 w. Can Engr—March 27, 1913. No. 40935.

Road Metal. From a government report, by W. A. McLean. Considers depth of material, waterproofing, quality of stone, etc. 2500 w. Can Engr—April 10, 1913. No. 41205.

See also Road Models and Road Metal, under *Roads and Pavements*.

Material Transport

Mechanical Haulage. George Symon. A statement showing the expenditure and earnings of a steam cart used at Blaydon, Eng. 1500 w. Surveyor—Nov. 29, 1912. No. 38120 A.

Michigan

Road Construction in Michigan. Frank F. Rogers. Information concerning the construction, grading, drainage and cost of macadam roads. 3000 w. Munic Engng—April, 1913. No. 41606 C.

Motor Traffic

Automobiles and Improved Roads. Logan Waller Page. Discusses the economics of motor traffic and of highway construction. Ills. 2000 w. Sci Am—Sept. 6, 1913. No. 45016.

New Jersey

Experimental Road Work of the Public Roads Department of New Jersey. Description of the work taken from a report of Robert B. Gage. 2500 w. Engng & Con—June 4, 1913. No. 42662.

New York

Advisory Roads Commission for New York State. Individual report of Mr. Eugene W. Stern. Considers the organization and administration, types of roads, maintenance, etc. 2500 w. Can Engr—April 17, 1913. No. 41341.

Reports on the Organization of a Highway Department for the State of New York. Gives reports submitted by the commission appointed by the governor. 2500 w. Eng News—April 17, 1913. No. 41333.

The Long Clove-Haverstraw State Highway. Describes the construction of a road on the west bank of the Hudson River on slope of steep talus, which was unusually difficult. Ills. 1600 w. Munic Jour—May 1, 1913. No. 41856.

Resumption of Road Work in New York State. Charles E. Foote. An account of the work in progress this season. Ills. 2000 w. Horseless Age—Aug. 13, 1913. No. 44367.

Oil Storage

Municipal Plant for the Storage of Road Oil. William H. Kershaw. Abstract

Consult Classification of the Index. See page 9.

Ontario

of a paper read before the Am. Assn. for the Adv. of Science. Considers types and gives an illustrated description of type recommended. 1100 w. Engng & Con—Feb. 5, 1913. No. 39694.

Ontario

Good Roads in Ontario. Abstract of an address by W. A. McLean before the Ontario Good Roads Assn. Briefly discusses road drainage, labor, freight rates on stone, etc. 2200 w. Can Engr—March 20, 1913. No. 40786.

See also Construction, under *Roads and Pavements*.

Organization

Organization of a Municipal Highway Bureau. Gives a suggested organization for a bureau of highways and street cleaning, showing the essential features to be considered. 2500 w. Engng & Con—Dec. 18, 1912. No. 38313.

Pavements

Paving Conditions in Southern Cities. Information concerning conditions in Birmingham, Ala.; Nashville, Tenn.; Louisville, Ky., and other places. Ills. 2500 w. Munic Engrg—Feb., 1913. No. 40094 C.

Paving Blocks

Wire-Cut Lug Paving Blocks. F. B. Marsh. Describes this paving block, explaining its advantages. Ills. 1500 w. Eng Rec—July 12, 1913. No. 43654.

Paving Machine

A Street-Paving Machine. Carroll Ashley. Illustrated description of a machine in Los Angeles for the complete mechanical paving of streets. 900 w. Eng News—Nov. 7, 1912. No. 37314.

Paving Maintenance

See same heading under *STREET AND ELECTRIC RAILWAYS*.

Paving Tests

Tests of Concrete and Brick Pavements. Gives details of types tested with the "determinator" at the Am. Road Cong., with statement of results. Ills. 1500 w. Eng Rec—Oct. 25, 1913. No. 46208.

Pennsylvania

The Highway Emergency in Pennsylvania. Charles E. Foote. Discusses road conditions in the State. 2000 w. Horseless Age—Aug. 27, 1913. No. 44870.

Philippines

Road Construction and Maintenance in the Philippines. Information from the recently issued report of the Bureau for the year ending June 30, 1912. 2000 w. Engng & Con—April 30, 1913. No. 41819.

Plank Road

Building a Paved Roadway Across a Swamp. James Owen. Explains the conditions and problems encountered in con-

ROADS AND PAVEMENTS

Repairs

structing a plank road from Newark to Jersey City, N. J. 1500 w. Eng News—March 27, 1913. No. 40936.

Planning

The Planning of New Streets and Roads. Abstracts of papers and communications read before the Int. Road Congress, dealing with the construction and maintenance of roads. Also discussion. 10000 w. Surveyor—June 27, 1913. No. 43631 A.

Public Roads

Report of the Director of the Office of Public Roads for 1912. Logan Waller Page. Reviews the work of the year and outlines the plans for the current year. 43 pp. U S Dept of Agri—Nov. 4, 1912. No. 38668 N.

Purchasing

Systematizing the Purchase of Road Materials and Equipment. Henry G. Shirley. Read at Detroit Road Cong. Explains the system used by the State Roads Commission of Maryland. 1200 w. Mfrs' Rec—Oct. 2, 1913. No. 45619.

Quebec

Road Practice of the City of Westmount. A. Currie. Describes various types of pavement and their construction. Ills. 5000 w. Con Rec—June 11, 1913. No. 42804.

Reconstruction

Methods and Cost of Roadway Reconstruction in the Lincoln Park System, Chicago, During 1911. M. M. Lawrence and W. S. Maynard. Describes the work and gives tabulated costs. 2500 w. Engng & Con—Dec. 4, 1912. No. 38049.

Road Making Developments. Describes the main features of reconstruction work in the British Isles. 3000 w. Surveyor—June 13, 1913. No. 43136 A.

The Reconstruction of Carriageways. Ernest H. Essex. Extracts from the annual report describing modern methods tried in Leyton. 11500 w. Surveyor—Oct. 10, 1913. No. 45975 A.

Reinforced Concrete

Construction of Reinforced Concrete Pavements and Roadways. H. S. Doyle. Illustrates and describes methods of construction. 4500 w. Con Rec—June 11, 1913. No. 42805.

Reinforced Concrete Paving at Port Huron, Mich. Earl R. Whitmore. A study of the comparative merits of asphalt macadam and reinforced concrete, with outline of specifications for concrete pavement. 4000 w. Engng & Con—July 16, 1913. No. 43818.

Repairs

Repair and Maintenance of Roads. Dr. L. I. Hewes. Read before the Ontario Good Roads Assn. Considers the repair

Repaving

and maintenance of a typical, well organized country road system. 2500 w. Can Engr—March 13, 1913. No. 40678.

Repaving

The Laying of 102 Miles of Smooth Road Surface in One Borough in Five Months. G. Howland Leavitt. Outlines work in the Borough of Queens, New York City. 5000 w. Pro Am Road Bldrs Assn—1913. No. 46173 N.

Resurfacing

The Resurfacing of 102 Miles of Highway in Five Months. An account of work of the Highway Bureau of Queens Borough, New York City. 2500 w. Engng & Con—Dec. 18, 1912. No. 38314.

Road Congress

Lessons from the International Road Congress. William D. Sohler. 400 w. Eng Rec—Oct. 11, 1913. No. 45811.

Road Machinery

Modern Road Making Machinery and Its Uses. T. R. Agg. Read before the Illinois Soc. of Engrs. & Survs. Describes the variety and uses of present-day machinery for maintaining public highways. 4000 w. Engng & Con—Feb. 5, 1913. No. 39695.

Road Metal

Tests of Road Metal. C. W. L. Alexander. Report of tests made in the Olsen rattler, at University College, Cork. 1800 w. Surveyor — Feb. 14, 1913. No. 40121 A.

Road Models

Descriptive Catalogue of the Road Models of the Office of Public Roads. Gives 17 plates, illustrating standard types of road construction, with descriptions arranged to show the historic development of road building. 11000 w. U S Dept of Agri, Bul 47—March 27, 1913. No. 41636 N.

Road Stones

Nomenclature of Road Stones. Discusses the standardization of road material, giving a short résumé of work already accomplished. 1400 w. Surveyor —Aug. 1, 1913. No. 44311 A.

Road Traffic

Road Traffic and Treatment. Col. William D. Sohler. Read before the Am. Road Bldrs. Assn. Shows the importance of knowledge of traffic in making a wise selection of pavement and materials. 1800 w. Munic Jour—Jan. 2, 1913. No. 38787.

A Proposed Standard Record of Street Traffic. From a report to the Am. Soc. of Munic Imp. Discusses the need for traffic records and presents a method for practical use. 2500 w. Eng News—Jan. 2, 1913. No. 38777.

Sand-Clay

Sand-Clay Roads in North Carolina.

ROADS AND PAVEMENTS**Street Cleaning**

Information from a report by Dr. Joseph Hyde Pratt concerning the materials, construction, etc. 2500 w. Eng Rec—Dec. 7, 1912. No. 38077.

Saskatchewan

Roads of Saskatchewan. A. J. McPherson. Read before the Can. Highway Assn. Information concerning the development, the organization, construction, maintenance, etc. 6000 w. Can Engr—Nov. 21, 1912. No. 37774.

The Red and Black Roads of Saskatchewan. Condensed report of Prof. W. W. Andrews. Gives an account of experimental investigations. 3000 w. Can Engr—April 17, 1913. No. 41339.

Specifications

Specifications for Roads of Different Types. Gives specifications used in Ontario for various kinds of pavement. 5500 w. Can Engr—Jan. 2, 1913. No. 38839.

Sprinklers

French Motor Sprinkling Carts. Francis P. Mann. Illustrates and describes types. 800 w. Munic Jour—Feb. 6, 1913. No. 39677.

Stone

The Construction of Broken Stone Roads. E. A. James. Considers the advantages of this type for rural highways, and approved constructional practice. 2200 w. Con Rec—April 30, 1913. No. 42071.

Street Cleaning

Methods and Costs of Street Cleaning at Washington, D. C., During 1911-12. An account of the work done, methods, and cost. 2000 w. Engng & Con—Dec. 18, 1912. No. 38312.

Newark Street Cleaning Records. Describes methods of cleaning by machine and hand brooms and flushes, and records that permit comparison of work by different foremen. Ills. 2500 w. Munic Jour—Feb. 6, 1913. No. 39675.

Street Cleaning Methods in European Cities. Information from consular reports regarding London, Glasgow, Havre, Hamburg, and other cities. 7000 w. Engng & Con — March 26, 1913. No. 40840.

Street Cleaning in Chicago, and Suggested Standards for Increasing the Efficiency. Information from the report of the Efficiency Division of the Civil Service Commission. 6500 w. Engng & Con—Jan. 1, 1913. No. 38769.

Street Cleaning Efficiency Standards for Chicago. F. H. Cenfield and A. B. Segur. Standards based on a detailed analytical study of street-cleaning conditions and methods. 2700 w. Eng News—Feb. 27, 1913. No. 40236.

Consult Classification of the Index. See page 9.

Street Cleaning

Street Cleaning in Downtown Chicago. Richard T. Fox. Explains the organization and method of providing for the cost. Discussion. 8500 w. Jour W Soc of Engrs—Feb., 1913. No. 40410 D.

Motor Road-Cleaning Machine. Illustrated description of a mechanically-driven road-sweeping machine on trial in England. 800 w. Engng—April 11, 1913. No. 41393 A.

Pneumatic Street Cleaning. C. A. Tripp. A critical discussion of street cleaning systems in use, and presenting the advantages of pneumatic cleaning. Ills. 2500 w. Indiana Engng Soc—1912. No. 41731 N.

Cleaning Streets in Washington. J. W. Paxton. Describes methods which include hand patrol, machine-broom cleaning, squeegees and flushing. 2000 w. Eng Rec—Sept. 27, 1913. No. 45478.

Recent Progress in Methods and Character of Street Cleaning. S. Whinery. Read before the Am. Pub. Health Assn. On improved machinery and appliances, analysis of cost and problems receiving attention. 1700 w. Engng & Con—Sept. 17, 1913. No. 45227.

See also Cost Keeping, under *Municipal*.

Street Design

Planning of New Streets and Roads. Abstract of a report presented by Nelson P. Lewis to the Third Int. Road Cong. Discusses conditions in the United States and the problems they present. 5000 w. Engng & Con—Sept. 10, 1913. No. 45057.

Principles Underlying Scientific Street Design. J. Russell Ellis. Read before the Regina Engng Soc. Discusses details and requirements. 3500 w. Con Rec—Aug. 27, 1913. No. 44865.

Street Sprinkling

Street Sprinkling and Oiling at St. Paul, Minn. Information from the last annual report of the commissioner of public works, describing the methods followed. 3000 w. Engng & Con—Sept. 10, 1913. No. 45058.

Substructure

The Choice of Materials for Substructures (La scelta dei materiali da massiciata). Gino Toller. Theories for correct distribution of materials, and apparatus for testing their qualities. Ills. 4200 w. Monit Tec—Jan. 30, 1913. No. 40617 D.

Suburban

Development of the Modern Country Roadway. George C. Warren. Discusses the country roadway as distinguished

ROADS AND PAVEMENTS**Tar Macadam**

from the city pavement, outlining its development. Ills. 12800 w. Jour Am Soc of Engng-Con—Jan., 1913. No. 41263 C.

Good Roads. C. N. Little. Address at Boise, Idaho. The importance of good roads, especially to the farmer, with discussion of earth, gravel, macadam and related subjects. 6500 w. Jour of Idaho Soc of Engrs—June, 1912. No. 41727 N.

Surfaces

Experiments with Road Surfaces. Discusses results of experiments in England to determine the wearing qualities of different road surfaces. Tabulated data, and editorial. 6500 w. Engr, Lond—Jan. 24, 1913. No. 39811 A.

The Wheel and the Road. R. E. Crompton. Appendix by Leslie Hounsfield. Read before the Inst. of Auto. Engrs. Discusses the wear of pavements under motor vehicles and the surface treatment and binders used. Ills. 6500 w. Surveyor—April 18, 1913. No. 41756 A.

Road Pavements on the Pacific Slope. T. S. Scott. Illustrates and describes surface treatments suited to the climate. 1500 w. Con Rec—June 18, 1913. No. 42973.

Surface Treatment

The Splitter Treatment and Waste Sulphite Liquor Oil Sand Treatment as Practiced in Connecticut. Maurice O. Eldridge. Illustrated account of the splitter treatment for gravel roads and the waste sulphite liquor oil sand treatment for new macadam roads. 1000 w. Engng & Con—Dec. 11, 1912. No. 38143.

Surfacing

The Top-Soil Method of Road Construction. Abstract of paper by Charles M. Strahan, read before the Am. Road Cong. Explains the methods and principles involved. 2500 w. Engng & Con—Nov. 13, 1912. No. 37563.

Road Carpets. W. W. Crosby. Discusses the effects of motor traffic on macadam roads and their maintenance, and the limits of the carpeting system, the materials and methods. 3000 w. Surveyor—April 11, 1913. No. 41382 A.

Tar Macadam

Tar Macadam Construction by the Board of Public Roads of Rhode Island in 1912. Herbert C. Poore. Gives the bituminous surface specifications used. Ills. 2000 w. Engng & Con—Feb. 26, 1913. No. 40228.

Tar-Spraying and Tar-Macadam in Situ. Thomas Aitkin. Observations on results obtained from actual experience in the use of high-pressure tar-spraying machines in surface treating macadamized roads and kindred matters. 4500

Consult Classification of the Index. See page 9.

Traction

w. Surveyor—June 27, 1913. No. 43629 A.

Traction

Some Recent Tests to Determine Effects of Grade and Surface of Roads on Tractive Force. Abstract of a paper by E. B. McCormick, read before the Am. Road Cong. Describes tests run with a traction dynamometer wagon, giving tabulated results. 2500 w. Engng & Con—Nov. 6, 1912. No. 37283.

Traffic

See City Traffic, under *Municipal*.

Traffic Census

Traffic Census on Highways. L. J. Hewes. Directions for the taking of traffic data in connection with road improvements. 2000 w. Eng Rec—May 17, 1913. No. 42220.

Traffic Study

Traffic Study on the Highways of Massachusetts. Charles E. Foote. A study of what amount of traffic different kinds of roadways will stand and the relative destructive effects of different kinds of traffic. 2200 w. Horseless Age—Oct. 1, 1913. No. 45632.

The Traffic Census as a Preliminary to Road Improvement. William D. Sohler. Explains how the traffic census is made, its importance, and the increase caused by good roads. Things that affect the wear of roads, maintenance, costs and related topics. 11500 w. Pro Am Road Bldrs Assn—1913. No. 46172 N.

Report of the Parliamentary Commission on Motor Traffic in London (Bericht der Parlamentskommission über den Verkehr mit Motorfahrzeugen in London). A division of the study, the sittings of the commission, and a resumé of the findings. Serial, 1st part. 3100 w. Auto Rund—Sept. 15, 1913. No. 46057 D.

Types

Comparative Advantages of Different Types of Roads. John R. Robbin. Read at Int. Road Cong. A technical and economic study. 1400 w. Engng & Con—Aug. 6, 1913. No. 44210.

Valuation

Site Value Deductions for Construction of and Appropriation of Land for Roads. Richard G. G. Reed. Read at meeting of the Surveyors' Inst. Discusses some of the difficulties of the British Finance Act, 1910. 2500 w. Archt, Lond—May 2, 1913. Serial. 1st part. No. 41989 A.

Wear

The Extent and Wear of Pavements in Canadian Cities. Classification of data on the various types in extensive use and their suitability for different kinds of traffic. 4500 w. Can Engr—Sept. 25, 1913. No. 45505.

ROADS AND PAVEMENTS

Wood Block

Wisconsin

Instructions for Foremen and Contractors on State Road Construction in Wisconsin. Abstract of Bul. 12, Wis. State Highway Commission. 6000 w. Eng News—Aug. 14, 1913. No. 44370.

Wood

Practice and Experience with Algarrobo Wood Pavements in Buenos Aires, Argentina. Information from a paper by Claro C. Dassen, read before the Int. Road Cong. Describes practice in using algarrobo block pavement. Ills. 1700 w. Engng & Con—Aug. 20, 1913. No. 44493.

Third International Road Congress. Discussions and abstracts of papers on wood paving. 5000 w. Surveyor—July 25, 1913. Serial, 1st part. No. 44177 A.

Wood Block

Creosoted Block Paving in Chicago. John Ericson. Discusses the treatment of the blocks. Ills. 1500 w. Munic Engng—Jan., 1913. No. 39534 C.

Creosoted Wood Block Pavement Laid by City Day Labor in Minneapolis. Ellis R. Dutton. Read before the Am. Road Bldrs. Assn. Describes the work, discussing points necessary to secure good construction. 1600 w. Eng News—Jan. 2, 1913. No. 38780.

How Nearly Does the Modern Yellow Pine Block Pavement Approach to the Ideal Pavement, and What Improvements Can We Suggest? H. L. Collier. Considers the cardinal points of an ideal pavement, and compares the yellow pine block. Discussion. 8500 w. Am Wood Pres Assn—Jan., 1913. No. 43279 N.

Timber for Creosoted Block Paving. Harry G. Davis. Discusses the essential principles to insure success in this kind of pavement. Discussion. 2200 w. Am Wood Pres Assn—Jan., 1913. No. 43280 N.

Laying Wood Block Pavement. H. S. Loud. Directions for the proper construction. 8500 w. Am Wood Pres Assn—Jan., 1913. No. 43281 N.

European Creosote Specifications for Paving Block for City Streets. E. A. Sterling. Discusses the desirability of reducing the amount of oil impregnation. 1600 w. Eng Rec—May 3, 1913. No. 41847.

Wood Block Pavements. George W. Tillson. Presented at Third Int. Road Cong., London. Reviews their development in the United States and the specifications governing their use. 5000 w. Can Engr—July 24, 1913. No. 43909.

Creosoted Wood Block Pavement in the City of Minneapolis, Minn., as Laid by the City, by Day Labor. Ellis R. Dutton. Illustrated description of the work with general discussion. 3000 w. Pro Am Road Bldrs Assn—1913. No. 46163 N.

Analyses

WATER SUPPLY

Ashokan Reservoir

Analyses

The Interpretation of Water Analyses. Jerome Cochran. Shows the importance of water supply inspection, and considers the physical, chemical, microscopical and bacterial tests. 1200 w. Cornell Civ Engr—Feb., 1913. No. 40091 C.

Determinations of Real and Doubtful Value in the Routine Water Analyses Usually Made in Connection with Sanitary Surveys. Dr. H. E. Bernard. Read before the Am. Pub. Health Assn. Discussion and conclusions. 2200 w. Engng & Con—Sept. 17, 1913. No. 45230.

Aqueducts

Some Notes on Construction Methods and Costs of Work on the Los Angeles Aqueduct. Information abstracted from the latest annual report of William Mulholland. 4000 w. Engng & Con—Nov. 27, 1912. No. 37924.

The Final Completion and Operation of the Los Angeles Aqueduct. Illustrated general description of the whole work, the economies of construction and the economic importance of the enterprise. 3500 w. Can Engr—Jan. 9, 1913. No. 38961.

Construction and Completion of the Los Angeles Aqueduct. Burt A. Heiny. Illustrated description of this remarkable water supply, irrigation and power project. 5000 w. Engineering Magazine—April, 1913. No. 40906 B.

Surplus Water of the Los Angeles Aqueduct. Burt A. Heiny. Explains the Mulholland plan and the Graham plan for selling water that will not be needed for some years. 5500 w. Eng News—March 13, 1913. No. 40655.

Completion of the Los Angeles Aqueduct. Burt A. Heiny. Illustrates and describes features of this great engineering work, and gives information concerning the difficulties overcome in its construction and matters related. 3500 w. Munic Engng — April, 1913. No. 41605 C.

The Meaning of the Los Angeles Bond Election. Editorial on the defeat of the bond issues for the completion of work accessory to the Los Angeles aqueduct, and the principles involved. 2500 w. Eng News—May 1, 1913. No. 41868.

Construction Methods Employed on the Shafts and Tunnel of the Under-City Section of the Catskill Aqueduct. Information from the annual reports of the Board of Water Supply of the City of New York for 1911 and 1912. Ills. 3500 w. Engng & Con—June 18, 1913. No. 42942.

The Completion of the Los Angeles Aqueduct. Burt A. Heiny. Brief illus-

trated description of the works, with historical details and explanation of the operation and other information. 4000 w. Eng News—June 19, 1913. No. 42981.

The Failure of the Sand Canyon Pressure Tunnel Siphon of the Los Angeles Aqueduct. Burt A. Heiny. Illustrated account of the break that occurred on May 19, and the rebuilding made necessary. 1200 w. Eng News—June 5, 1913. No. 42702.

Antelope Valley Siphon, Los Angeles Aqueduct. William W. Hurlbut. Illustrated description of four-mile concrete and steel pipe riveted under the bonus system. 2500 w. Eng Rec—July 19, 1913. No. 43785.

The San Francisquito Power Station No. 1. Illustrated description of the high head development in the Los Angeles aqueduct, receiving water through riveted steel, lap-welded and banded lap-welded penstocks. 2000 w. Eng Rec—Aug. 23, 1913. Serial, 1st part. No. 44549.

Monolithic Construction of Heavily Reinforced, 17-foot Circular Aqueduct. Henry Wade Nelson. Illustrates and describes construction methods on Kensico effluent conduit of the Catskill aqueduct. 4500 w. Eng Rec—May 3, 1913. No. 41850.

The Apulian Aqueduct, Southern Italy (L'aqueduc des Pouilles Italie meridionale). Sennoro Fattorini. General description of aqueduct, 213 km. in length, furnishing water for domestic, irrigation and industrial purposes for three provinces. Ills. 3700 w. Genie Civil—Aug. 23, 1913. No. 45352 D.

The Winnipeg-Shoal Lake Aqueduct. Maps and description of the proposed route and design of the 95-mile water supply line for the Winnipeg water district. 3000 w. Can Engr—Oct. 23, 1913. No. 46190.

See also Steam Shovels, under *Construction*, and Catskill Aqueduct, under *Water Supply*.

Artesian

The Effect of Artesian Water Upon Galvanized Steel Pipe at Moline, Ill. From a paper by D. H. Stacks, read before the Illinois Water Sup. Assn. Gives details of the experience and the methods employed in removing the cause of the trouble. 1600 w. Engng & Con—May 28, 1913. No. 42516.

Ashokan Reservoir

Providing for Ten Million. J. F. Springer. Illustrated account of the clearing out of the Ashokan reservoir which will eventually supply 500,000,000 gallons of water per day for New York

Consult Classification of the Index. See page 9.

Birmingham, England

City. 3500 w. Cassier's—July, 1913. No. 43352.

Birmingham, England

The Works for the Supply of Water to the City of Birmingham from Mid-Wales. Ernest Lawson Mansergh and Walter Leahy Mansergh. Illustrated detailed description of the scheme and its execution. Also abstract of discussion. Plates. 90 pp. Inst of Civ Engrs—No. 3963. No. 42369 N.

Canal Linings

Lining Ditches with Reinforced Concrete. Describes a method of lining irrigation ditches with expanded metal and cement mortar applied with the "cement gun." Ills. 1800 w. Concrete-Cement Age—June, 1913. No. 42808.

Catskill Aqueduct

Creating Subterranean River Ninety Miles in Length. Brief illustrated account of how Catskill water is being brought to New York. 2200 w. Sci Am—March 1, 1913. No. 40293.

Supplying a Metropolis with Mountain Water. Illustrates how mining operations are being carried on through the heart of New York to carry the water into Brooklyn and Queens, describing interesting methods of work. 2500 w. Sci Am—March 1, 1913. No. 40294.

Chicago

Use, Waste and Metering of Water in Chicago. Statements from a recently published report concerning the consumption and waste of water and the need of metering as a remedy. 1500 w. Eng News—Dec. 26, 1912. No. 38589.

See Pipes, under *Water Supply*.

China

Hankow Water Works. Illustrated description of these works and their construction, explaining labor conditions and other particulars. 2800 w. Engng—Feb. 7, 1913. No. 39914 A.

Chlorination

Chlorinating Plants, Croton Water Supply. T. D. L. Coffin. Illustrates and describes several plants in the Croton drainage area, and gives results of a temporary plant. 2000 w. Eng News—Feb. 27, 1913. No. 40239.

Elimination of Tastes from Chlorinated Water. Arthur Lederer and Frank Bachmann. Gives results of careful tests made on L. Michigan water, concluding that sodium thiosulphate is a satisfactory remedy. 2500 w. Eng Rec—March 22, 1913. No. 40766.

Clarification

Studies on the Clarification of Treatment Waters at Birkenberg (Studien zur Klärung der Aufbereitungswasser in Birkenberg). Hans Fleissner. Modes of

WATER SUPPLY**Dam Design**

separating turbid matter in water for use in silver and lead extraction. Serial, 1st part. 2100 w. Oest Zeit f Berg u Hütten—Sept. 20, 1913. No. 46000 D.

Coagulation

A Study of the Efficiency of Coagulating Basins. W. F. Monfort. A paper before the Illinois Water Supply Assn. A summary of facts relating to the efficiency of coagulating basins of the St. Louis waterworks. 4500 w. Engng & Con—March 26, 1913. No. 40843.

Colorado

Municipal Water Supplies of Colorado. Clement C. Williams. Aims to present the sanitary conditions of the state in regard to municipal water supplies, and to suggest the water resources available. 56 pp. Univ of Colo Bul—Sept., 1912. No. 40418 N.

Conduits

A New Formula Under Uniform Systems for Circular Hydraulic Conduits (Nuova formula sul regime uniforme nelle condotte d'acqua a sezione circolare). L. Conti. Mathematical development of a uniform formula. Serial, 1st part. 3600 w. Ann della Soc d Ing e d Arch Ital—March 1, 1913. No. 40608 E.

Eight-Mile Concrete Conduits at Baker, Oregon. Describes method of replacing a wooden flume with molded pipes without interrupting service. 1500 w. Eng Rec—May 24, 1913. No. 42380.

Conservation

Progress in Developing and Conserving Water Supply for Municipal and Domestic Purposes. Allen Hazen. Extracts from a paper read at the Cong. of Ap. Chem. Discusses possibilities in the United States. 3000 w. Surveyor—Nov. 22, 1912. No. 38024 A.

Corrosion

Decarbonation as a Means of Removing the Corrosive Properties of Public Water Supplies. George C. Whipple. The methods discussed are aeration and the use of soda and lime. 8000 w. Jour N Eng W-Wks Assn—June, 1913. No. 43988 F.

Dam Design

The Significance of "The Middle Third." John C. Trautwine, Jr. Mathematical discussion of the design of dams, and similar structures. 1000 w. Pro Engrs' Club of Phila—Oct., 1912. No. 37713 D.

The Design and Construction of Masonry Dams. H. J. F. Gourley. Discusses the selection of a site, the foundations, the design, construction, drains, facing, etc. 5000 w. Surveyor—Nov. 8, 1912. No. 37636 A.

A New Phase of State Supervision of

Consult Classification of the Index. See page 9.

Dam Design

Dams. Editorial on the need of raising the standard of design in dams, advising a state board which shall possess sufficient power to refuse to authorize construction. 1200 w. Eng News—Nov. 21, 1912. No. 37729.

State Control of the Design and Construction of Dams and Reservoirs. Actual Practice in Eastern Connecticut. Charles E. Chandler. Discusses the operation of the law in regard to new dams in Eastern Connecticut. General discussion. 6500 w. Jour N Eng W-Wks Assn—Sept., 1912. No. 37911 F.

State Supervision of Design, Construction, and Operation of Dams and Reservoirs. Frank P. McKibben. Discusses the conditions as to state supervision and outlines the procedure recommended. Discussion. 8000 w. Jour N Eng W-Wks Assn—Sept., 1912. No. 37913 F.

Protection for Hollow Reinforced Concrete Dams. G. L. Bilderbeck. Discusses details in the design of dams of this class, and describes a method of protection. Ills. 1700 w. Eng News—Nov. 21, 1912. No. 37727.

The Reversed Dam; a Hollow Concrete Dam of a New Type. Frank C. Osborn. Drawing and computations of a typical dam of this design. 1200 w. Eng News—Dec. 19, 1912. No. 38333.

Dams

Some Features of the Construction and Failure of the Austin, Pa., Dam. T. Chalkley Hatton. A statement by the constructing engineer explaining the failure that occurred Jan. 23, 1910. Ills. 3500 w. Jour N Eng W-Wks Assn—Sept., 1912. No. 37914 F.

Amity Dam in the Arkansas River, Colorado. Sam G. Porter. Illustrated description of a development of pile, crib and pier, and reinforced concrete construction for dams successfully built on the sandy bottom of a river subject to floods. 2500 w. Eng Rec—Nov. 16, 1912. No. 37582.

Method and Cost of Constructing Two Dams for an Irrigation Works at Santa Fe, New Mexico. Ernest E. Meier. Outlines the project for irrigating 10,000 acres of desert land and illustrates and describes the construction of an uncoursed rubble masonry dam 80 ft. high, and an earth and rock fill dam with concrete core wall. 3500 w. Engng & Con—Nov. 13, 1912. No. 37568.

Methods and Cost of Constructing an Earth Dam, with Upstream Concrete Paving and Core Wall, for McAlester, Okla., Water Works. J. W. Holman. Sketch plans and description of work,

WATER SUPPLY

with costs. 2500 w. Engng & Con—Nov. 13, 1912. No. 37565.

Methods and Costs of Rebuilding South Dam, Head of Rock River Rapids at Lock 35 of the Illinois and Mississippi Canal. Charles W. Durham. Cross sections and description of the work. 2000 w. Eng & Con—Nov. 13, 1912. No. 37569.

Rio Grande Reservoir Dam. Illustrated description of a composite riprapped earth and rock-fill dam constructed by the basin-and-embankment method near Creede, Colo. 3000 w. Eng Rec—Nov. 9, 1912. No. 37851.

The Riverside Dam, Indianapolis, Ind.; Its Successive Failures and Repairs. Charles Brossmann. Illustrated description of the various failures and repairs of the structure. 900 w. Eng News—Nov. 7, 1912. No. 37315.

Flashboard Design and Experiences, McCall Ferry Dam. Illustrates and describes the main features and reports tests. 2000 w. Eng Rec—Dec. 7, 1912. No. 38074.

Wave Protection for Earthen Dams—Method and Costs of Placing Novel Concrete Facing on Three Dams at Uva, Wyoming. W. D'Rohan. Illustrated detailed description. 4000 w. Engng & Con—Nov. 27, 1912. No. 37926.

Methods Employed in Increasing the Height of an Earth Dam with Reservoir in Service at Greenwich, Conn. Sheldon E. Minor. From a paper before the Conn. Soc. of Civ. Engrs. Illustrates and describes the design and construction methods adopted. 1800 w. Engng & Con—Dec. 11, 1912. No. 38147.

General Method of Constructing a Rock Fill Dam 125 Ft High. Illustrates and describes the construction of a dam in Colorado, for the Pueblo Rocky Ford Irrigation Project. 1200 w. Engng & Con—Dec. 25, 1912. No. 38554.

Multi-Differential Arch Dam. Some Methods of Construction. George E. Ladshaw. Considers methods of constructing foundations, form work, etc. 1000 w. Cornell Civ Engr—Jan., 1913. No. 39394 C.

The Design and Specifications for the Arrowrock Dam, U. S. Reclamation Service. Illustrates and describes this, the highest masonry dam in the world, and interesting features of its construction. 1600 w. Eng News—Jan. 16, 1913. No. 39199.

Construction of Arched Masonry Dam at Las Vegas, New Mexico. William T. Barnes. Information concerning conditions and needs which made necessary the increase in storage of water, and the

Dams

Dams

WATER SUPPLY

Dams

trated description of the construction of of the dam. 7500 w. Jour N Eng W-Wks Assn—Dec., 1912. No. 39531 F.

Completion of the Rebuilt Assuan Dam. Reviews briefly the history of this work, and description of the reconstruction to increase the capacity. Ills. 1200 w. Eng News—Jan. 23, 1913. No. 39371.

The Assuan Dam and Its Recent Development. Sir Hanbury Brown. Deals with the subsequent history of the dam, the work of adding to the structure so as to increase the storage capacity. Also a forecast of the benefits expected. Ills. 2500 w. Engr, Lond—Jan. 17, 1913. Serial. 1st part. No. 39483 A.

Design and Construction of Oakley Dam. Illustrated description of a 145-ft. earth dam in Idaho, built between bluffs of lava with material brought to the site by train and belt conveyors. 3000 w. Eng Rec—Jan. 11, 1913. No. 38952.

Foundation for the Hale's Bar Dam. Illustrates and describes how pneumatic caissons were used for excavating seamy rock on the Tennessee River. 1500 w. Eng Rec—Feb. 15, 1913. No. 39865.

Concrete Arched Dam Near Cheyenne, Wyoming. M. V. Moulton. Illustrated description of a reinforced concrete structure built across the north fork of Crow Creek. 2000 w. Eng Rec—Feb. 8, 1913. No. 39727.

Hydraulic Fill Dam for Additional Water Supply of Cambria Steel Works. Illustrated description of a dam built of sluiced material, flushed to place through a system of wooden flumes. 4500 w. Eng Rec—Feb. 15, 1913. No. 39863.

The Lahontan Dam, Trucker-Carson Irrigation Project, U. S. Reclamation Service. F. H. Tillinghast. Illustrated detailed description of the design and structural features, construction, etc. 8000 w. Engng & Con—Feb. 12, 1913. No. 39836.

Fremantle Graving Dock: Steel Dam Construction for North Wall. Joshua Fielden Ramsbotham. Illustrated detailed description of work in Western Australia, which had to be abandoned. 6500 w. Pro Am Soc of Civ Engrs—Feb., 1913. No. 40170 F.

Unique Construction Methods and Devices Employed at Lock and Dam No. 1, Mississippi River Improvement. General illustrated description and description of special features of the work. 2000 w. Engng & Con—March 19, 1913. No. 40728.

Dam and Embankment Failures in 1912. Myron L. Fuller. Gives a summary of the failures, discussing the types of structures and the causes of destruction. 3000 w. Engng Rec—April 19,

1913. No. 41354.

Arrowrock Dam, Boise Irrigation Project. Brief description of the highest dam in the world, now under construction in Idaho. Ills. 1000 w. Eng Rec—Feb. 22, 1913. No. 40104.

The Arrowrock Dam. Charles H. Paul. Illustrated account of the location and construction of this dam in Idaho, which will be the highest dam yet built. 4000 w. Jour of Idaho Soc of Engrs—June, 1912. No. 41723 N.

Construction of Arrowrock Dam. Illustrates and describes work on this highest masonry dam in the world. Cement is conveyed to mixer by compressed air pipe line and concrete placed by hoppers and trough suspended from cableway. 3000 w. Eng Rec—Sept. 6, 1913. No. 44996.

Excavation for the Arrowrock Dam, Idaho. Charles H. Paul. General description of the work, the equipment, operations, etc. Ills. 4500 w. Eng News—July 17, 1913. No. 43834.

Rockfill Diversion Dam with Concrete Core Wall, Minidoka Irrigation Project, Idaho. P. M. Fogg. Illustrated description of the dam and its construction. 1600 w. Engng & Con—April 9, 1913. No. 41196.

Improving the Des Moines Rapids. Illustrated description of the Keokuk dam across the Mississippi River, and its effects on navigation. 2500 w. Marine Rev—April, 1913. No. 41254 C.

Making a Cut-Off Wall by Grouting Fissured Rock, Lahontan Dam. D. W. Cole. Illustrated description of the construction of this feature of irrigation work in Nevada. 2800 w. Eng News—April 3, 1913. No. 41064.

A Cofferdam on Sand Bottom: Ohio River Dam No. 48. J. C. Oakes. Portion of a paper in *Prof.-Mem.*, Corps of Engrs., U. S. A. Describes methods used in constructing this dam and lock. Ills. 3500 w. Eng News—April 10, 1913. No. 41160.

Boring and Grouting a Fissured Foundation Beneath an Embankment Dam. D. W. Cole. Illustrated description of methods used on the Lahontan dam of the Truckee-Carson project. 3000 w. Eng Rec—March 29, 1913. No. 40956.

Hearings and Arguments in the Matter of the Application of the Rainy River Improvement Co. for Approval of Plans for a Dam at Kettle Falls. Also opinions filed April 18, 1913, and dissenting opinions. 3 parts. 158 pp. Int. Joint Com., Ottawa—May, 1913. No. 42498 N.

Accident at Dam 26 on the Ohio River. Gives data related to the examination of

Dams

the unwatered site of the dam that failed Aug. 8, 1912, taken from the report printed in the "Professional Memoirs" of the Corps of Engineers. 2500 w. Eng Rec—May 17, 1913. No. 42216.

Construction Features of Bear Creek Hydraulic-Fill Dam, Jordan River Development, Vancouver Island, British Columbia. C. E. Blee. Illustrated description of construction details. 7000 w. Eng & Con—May 21, 1913. No. 42310.

Construction of the Kachess Dam, Washington. E. H. Baldwin. Illustrated account of the construction of an earth dam 65 ft. high and 1400 ft. long. 8000 w. Eng. News—May 15, 1913. No. 42091.

Leaks in the Assuan Dam. Photographs and notes in proof that the leaks are of very slight importance. 1000 w. Engr Lond—May 2, 1913. No. 42010 A.

Mississippi River High Dam at St. Paul and Minneapolis. Adolph F. Meyer. Considers the design and the amount of power that will be made available by its construction. 4000 w. Jour Assn of Engng Soc's—May, 1913. No. 42439 C.

Use of Hydraulic Lime for Masonry Dam. Describes work near Santa Rosalia, Mexico, where hydraulic lime proved very satisfactory. 2000 w. Eng Rec—June 14, 1913. No. 42826.

Reinforced Concrete Hollow Dam of Buttress Type. J. K. Finch and W. F. Thoman. States the advantages of this type, describing the construction. Ills. 5500 w. Can Engr—May 29, 1913. No. 42626.

Raising the Assuan Dam. Describes methods of thickening the cross-section and increasing the height of the structure. Ills. 4000 w. Eng Rec—June 28, 1913. No. 43305.

Construction of the Spaulding Dam. Describes the design and construction of a masonry structure in California which will eventually be the highest dam in the world. Ills. 1500 w. Eng Rec—Aug. 9, 1913. No. 44239.

Experiments on Uplift Pressure in Masonry Dams. C. R. Weidner. Abstract translation of an article in *Zeit. für Bauwesen*, giving results of experiments in Germany to determine the uplift pressure of Oester and Neye dams. Ills. 3000 w. Eng News—July 31, 1913. No. 44110.

Operation of the Mohawk River Bridge Dams. D. A. Watt. Notes on the experience obtained in the operation of the 8 movable dams across the lower Mohawk River, in its canalization for the Barge Canal. Ills. 6500 w. Eng News—Aug. 14, 1913. No. 44369.

Neglected First Principles of Masonry Dam Design. George Holmes Moore.

WATER SUPPLY

Deals with a few examples of various neglected first principles. 3000 w. Eng News—Sept. 4, 1913. No. 44984.

The Design of Masonry Dams. Editorial letters called out by the article by G. H. Moore in the issue of Sept. 4. 4000 w. Eng News—Sept. 25, 1913. No. 45491.

The Ultimate Dam. John S. Eastwood. Discusses design and construction with special reference to the Eastwood multiple-arched dam at Big Bear Valley. Ills. 2000 w. W Engng—Sept., 1913. No. 45235 C.

Construction of the Scotia Lock and Dam Across the Mohawk River, Near Schenectady, N. Y. Illustrates and describes the preliminary construction work. 800 w. Engng & Con—Sept. 3, 1913. No. 44974.

Pneumatic Caissons for Scotia Dam. Explains how foundation methods used for substructures of lofty office buildings were applied to the work of the N. Y. State Barge Canal. Ills. 2500 w. Eng Rec—Aug. 30, 1913. No. 44896.

A Description of the Principal Bridge Dams in the United States and in Foreign Countries. H. G. Tyrrell. Explains the advantages and disadvantages of these structures and describes types. 4500 w. Engng & Con—Oct. 22, 1913. No. 46131.

Elephant Butte Dam. An outline of the work of constructing this storage dam across the Rio Grande, in New Mexico. Ills. 1200 w. Eng Rec—May 17, 1913. No. 42221.

Elephant Butte Dam Construction. Louis C. Hill. Illustrates and describes the preliminary work and the construction plant. 4000 w. Eng Rec—Oct. 4, 1913. No. 45671.

See also Spillways and Reservoirs, under *Water Supply*; Hydroelectric, under *ELECTRICAL ENGINEERING, Water Supply*.

Drinking Water

A Successful Factory Drinking Water System. Walter J. Bitterlick. Description of the system. 1500 w. Ind Engng—Sept., 1913. No. 44941 C.

Edmonton, Alta.

The Water Supply of Edmonton, Alta. Describes the present system, discussing extensions necessary and the source of supply. 4000 w. Can Engr—Sept. 18, 1913. No. 45253.

Evaporation

Method of Estimating the Amount of Evaporation from Water and Soil Surfaces in the Livermore Valley of California. Information from a report of the Spring Valley Water Co. of San Francis-

Filtration

co. 3000 w. Engng & Con—April 30, 1913. Serial. 1st part. No. 41823.

Filtration

Some Improvements in Devices on Filtration Plants. Abstract of a paper by F. B. Leopold, read before the Cent. States W.-Wks. Assn. Diagrams and descriptions. 1800 w. Engng & Con—Nov. 13, 1912. No. 37567.

The Queen Lane Filtration Plant. S. M. Swaab. Historical sketch of the project with a description of the construction and operation of this filter plant of the Philadelphia water supply, and an outline of the process of purification. Ills. 8500 w. Pro Engrs' Club of Phila—Oct., 1912. No. 37712 D.

Water Filtration in Minneapolis. A. W. Elison Fawkes. Explains conditions and gives an illustrated detailed description of the mammoth filtration plant. 4500 w. Munic Engng—Dec., 1912. No. 38645 C.

Toronto's Water Filtration Project. Discusses the problem of whether slow sand filtration or rapid mechanical filtration provides the most efficient system. Editorial and letter from T. Aird Murray. 5000 w. Can Engr—Dec. 12, 1912. No. 38272.

Uses and Abuses of Water Filtration. Gilbert H. Pratt. Explains conditions which call for filtration and what can be accomplished, and points out ways in which filtration plants are sometimes abused. Short discussion. 5500 w. Jour N Eng W-Wks Assn—Dec., 1912. No. 39530 F.

The Filtration Plant of the Montreal Water and Power Company at Montreal, Que. Illustrated description of a plant of the rapid mechanical gravity type. 1500 w. Can Engr—Jan. 23, 1913. No. 39410.

Filtration Plant at the Great Lakes Naval Training Station. Illustrated description of a slow-sand installation for purifying Lake Michigan water. 1200 w. Eng Rec—Feb. 22, 1913. No. 40102.

The Design of the Rapid Water Filtration Plant at Columbus, Ind. Philip Burgess. Paper before the Indiana San. & Water Supply Assn. Describes the conditions and details of the design. 3000 w. Engng & Con—March 5, 1913. No. 40348.

Increasing the Yield of Pittsburgh's Slow-Sand Filtration Plant. Describes the preliminary treatment of Allegheny River water by contact baffles of coarse stone and A-frame baffles across the sedimentation basin. Ills. 2800 w. Eng Rec—April 19, 1913. No. 41357.

Purification of Water by Slow and

WATER SUPPLY

Filtration

Rapid Sand Filtration. T. Aird Murray. Extracts from a paper before the Can. Pub. Health Assn. Inquiry into the efficiency and the conditions for which each system is adapted. 2500 w. Surveyor—April 18, 1913. Serial. 1st part. No. 41757 A.

Reports on Filtering the Croton Water-Supply. Reviews the 20-year campaign for improving the quality of the Croton supply for New York City. 10000 w. Eng News—May 22, 1913. No. 42351.

Methods of Rapid Sand Filtration. George A. Johnson. Extracts from the U. S. Geol. Survey Report, 1913. General description of the system, the cost of construction and maintenance. 5000 w. Can Engr—June 19, 1913. No. 42989.

Construction of the Grand Rapids Filtration Plant. L. D. Cutcheon. Illustrated description of a recently completed plant for purifying and softening the water supply. 3500 w. Munic Engng—June, 1913. No. 43177 C.

Methods and Labor Cost of Constructing the 39,000,000 Gal. Mechanical Water Filtration Plant at Minneapolis, Minn. W. N. Jones. Illustrated description of methods with summary of costs. 13500 w. Engng & Con—June 25, 1913. No. 43194.

The Design and Operation of the Minneapolis Water Filtration Plant. W. N. Jones. An account of the investigations made, describing conditions and available supplies, the filter plant finally built, and matters related. Ills. 6000 w. Engng & Con—June 11, 1913. No. 42797.

Tuning Up the Minneapolis Filter Plant. An interesting account of the initial difficulties of operation and methods employed to overcome them. Ills. 7000 w. Eng Rec—June 21, 1913. No. 43108.

Niagara Falls Filter Plant. Brief illustrated detailed description of this municipal plant. 1500 w. Munic Jour—June 26, 1913. No. 43241.

Micro-Organism Troubles and Mechanical Filters. Frederick H. Stover. Slightly condensed paper, read before the Am W-Wks Assn. Explains the general effect upon filters and methods of treatment. 3000 w. Eng Rec—July 26, 1913. No. 43934.

Filtration Plant at McKeesport, Pa. E. C. Trax. Explains why the river water is unfit for use, and illustrates and describes the filters. 2500 w. Munic Engrg—July, 1913. No. 44034 C.

Mechanical Filtration Plant at Clarksburg. H. W. Streeter. Describes details of design and gives results of operation

Consult Classification of the Index. See page 9.

Filtration

and cost of filtered water. Ills. 2500 w. Eng Rec—July 5, 1913. No. 43467.

Pressure Filtration Plant at Haileybury, Ontario. Illustrated description of the arrangement of this plant and its operation. 1500 w. Can Engr—July 3, 1913. No. 43680.

The Paterson System of Rapid Filtration. Illustrated detailed description of this rapid mechanical filter as working in the plant for the Borough of Cheltenham at Tewksbury pumping station. 3500 w. Engng—July 18, 1913. No. 43964 A.

Some Notes on the Use of Alum in Connection with Slow Sand Filtration at Washington, D. C. William Firth Wells. Explanation of the problem, with results of the treatment. 1800 w. Am W-Wks Assn—June, 1913. No. 44482 N.

Methods of Purifying Water in the Household, with Some Costs. J. H. Dunlap. Abstract of a paper read before the Iowa Engng. Soc. Discusses various types of household filters. 2500 w. Engng & Con—Aug. 27, 1913. No. 44779.

The Results of Experiments on Aeration Nozzles for the New Mechanical Water Filtration Plant at Baltimore, Md. Gives a description of experiments made to determine the proper size of nozzles, diameter and height of spray, and coefficient of discharge. 2500 w. Engng & Con—Sept. 10, 1913. No. 45062.

The Chemical and Biological Effect of Water Filtration. H. W. Cowan. Considers the organisms in earth and water and their functions, and the efforts to eliminate bacteria in water by filtration. 5500 w. Can Engr—Oct. 2, 1913. No. 45688.

Mechanical Gravity Filtration at Saskatoon. George T. Clark. Gives records of plant operation with respect to quantity of water filtered, chemical treatment, bacterial removal and costs, describing the plant. Ills. 2000 w. Can Engr—Oct. 2, 1913. No. 45687.

Results of Mechanical Gravity Filtration at Saskatoon, Sask. George T. Clark. Describes the plant and gives results and cost of operation. 1500 w. Con Rec—Oct. 1, 1913. No. 45635.

The St. Louis Mechanical Water Filters. Edward E. Wall. Outlines the history of the water supply from the standpoint of quality for the last fifty years, and describes the rapid filters being built. Ills. 3000 w. Eng News—Oct. 23, 1913. No. 46158.

Water Softening and Decoloration at Grand Rapids, Mich. Walter A. Sperry. Explains obstacles which had to be overcome and the methods in present use.

WATER SUPPLY

1800 w. Munic Engng—Oct., 1913. No. 46146 C.

See also Purification, under *Water Supply*, and Sewage Filters, under *Municipal*.

Fire Protection

The Basis of Charges for Private Fire Protection and a Discussion of the Service Required. Leonard Metcalf. Abstract of a paper read before the Am. W-Wks. Assn. Discusses the general principles underlying the making of charges, and outlines conclusions. 6500 w. Engng & Co.—July 23, 1913. No. 43873.

Arguments For and Against Charges for Private Protection by Water Departments with Special Reference to Conditions at Milwaukee, Wis. Sums up the arguments for and against the establishment of schedule charges with special reference to Milwaukee conditions. 4500 w. Engng & Con—July 30, 1913. No. 44050.

Auxiliary Water Supply for the Fire Protection of San Francisco. A. J. Clean. Describes a combination of cisterns and a high-pressure pumping system drawing water from the Bay or from special reservoirs. Ills. 3000 w. Eng Rec—July 26, 1913. No. 43936.

Fire Service

High Pressure Fire Mains in Philadelphia. John E. Codman. Illustrates and describes the cast-iron pipe, its inspection, tests of joints, etc. 1500 w. Eng Rec—Nov. 9, 1912. No. 37356.

National Standard Hose Couplings and Hydrant Fittings for Public Fire Service. F. M. Griswold. Urges the early adoption and use of a practical standard coupling for public fire service use. 5000 w. Jour Am Soc of Mech Engrs—March, 1913. No. 40436 D.

Baltimore High-Pressure Fire Service. James B. Scott. Illustrated description of the design of the high-pressure system, the pipe lines, choice of motive power, steam pumping station, and operation. 11000 w. Jour Am Soc of Mech Engrs—March, 1913. No. 40435 D.

See also Tanks, under *Water Supply*.

Fire Streams

The Hydraulics of Fire Streams from Small Hose and Nozzles. Virgil R. Fleming. Read before the Illinois Water Sup. Assn. Describes tests made at the University of Illinois. 2500 w. Engng & Con—April 9, 1913. No. 41198.

Fire Systems

Reasonable Requirements Imposed upon Water Systems by the Fire Protection Problem. Clarence Goldsmith. Discusses present conditions and the require-

Fire Systems

Flow

WATER SUPPLY

Ground Water

ments of the problem. Short general discussion. 2000 w. Jour N Eng W-Wks Assn—Dec., 1912. No. 39528 F.

The Design of a Water System for the Boiler Feed and Fire Protection of a Modern Saw Mill. R. W. Rea. Map and description of the yard and automatic sprinkler systems installed at Winchester, Idaho. 1500 w. Engng & Con—Jan. 15, 1913. No. 39182.

The Design and Operation of High Pressure Fire Systems. From a paper by Clarence Goldsmith, before the Mass. State Firemen's Assn. Considers the design and operation of such systems. 4000 w. Engng & Con—Oct. 15, 1913. No. 45894.

Flow

Reservoir Storage in Relation to Stream Flow. William J. E. Binnie and Herbert Lapworth. Also discussion. Shows the necessity of obtaining actual gaugings of the particular stream to be impounded before any sound estimate of reservoir storage can be made. 5500 w. Surveyor—June 27, 1913. No. 43630 A.

See also Meters, under *Measurement*.

Flumes

Reconstruction of an American River Flume. Lewis H. Eddy. Describes repairs near Placerville, Calif. Ills. 1500 w. Eng & Min Jour—March 29, 1913. No. 40955.

Concrete Slab Flume Construction. S. L. Stovall. Illustrated description of work in California. 4500 w. W Engng—May, 1913. Serial. 1st part. No. 42269 C.

Flume Construction on the Medina Valley Irrigation Project. A. C. Norton. A brief description of this project and illustrated detailed description of methods used in constructing the flumes. 5000 w. Colo Sch of Mines Mag—June, 1913. No. 42987 C.

See also Irrigation, under *Water Supply*.

Forests

Is a Forest a Storage Reservoir or a Stream Regulator? Guy Elliott Mitchell. Gives results of an investigation by the U. S. Geol. Survey of the effect of forest land on navigable streams. Ills. 1500 w. Sci Am—Dec. 28, 1912. No. 38632.

Franchises

On the Valuation of Water Works' Special Franchises. Henry de Forest Baldwin. An inquiry into the value. 12500 w. Am W-Wks Assn—June, 1913. No. 44476 N.

Great Lakes

See also Pollution and Filtration, under *Water Supply*.

Ground-Waters

The Development of a Ground Water Supply at La Crosse, Wisconsin. Map and description of the works, with special reference to the wells and the low lift pumping stations. 4500 w. Engng & Con—Dec. 18, 1912. No. 38315.

The Action of Ground Water on the Distribution of Springs (Grondwaterbeweging in de omgeving van bronnen). A. H. Borgesius. A theoretical discussion of the forces tending toward surface discharge, by comparing with the action of magnetic fields. Ills. 13000 w. De Ingenieur—Dec. 7, 1912. No. 39057 D.

Ground Water in Southern Districts (Over grondwater in het zuiden des lands). W. C. Klein. A study of geological conditions in southern Netherland. Ills. 5200 w. De Ingenieur—Dec. 21, 1912. No. 39060 D.

Methods of Discovering and Utilizing Subterranean Streams (Les moyens de découvrir les eaux souterraines et de les utiliser). Henri Mager. Abstracts from an encyclopedic study of the subject. The geologic features included. Ills. 2000 w. Bul Soc d'Encour—Dec., 1912. No. 40062 E + F.

Groundwater Flow in the Neighborhood of Streams (Grondwaterbeweging in de nabijheid van bronnen). H. A. Lorentz. Studies on flow in porous formations near brooks. 2000 w. De Ingenieur—Jan. 11, 1913. No. 40576 D.

Determining the Direction of Underground Channels by the Natural Water Courses (La misura della portata subalvea dei corsi d'acqua naturali). Umberto Puppini. A study of theoretical conditions in comparison with actual experiments. Ills. 4000 w. Monit Tec—Feb. 20, 1913. No. 40618 D.

The Ground-Waters. James F. Kemp. A summary and statement of present views. Considers meteoric water, the Connote waters, and magmatic waters. 10000 w. Bul Am Inst of Min Engrs—April, 1913. No. 41662 F.

Quantitative Estimation of Ground Waters for Public Supplies. Myron L. Fuller. Outlines information as to the water-bearing capacities of various rocks and unconsolidated materials and indicates the principal steps necessary in quantitative estimating the ground waters available. Ills. Discussion. 13000 w. Jour N Eng W-Wks Assn—June, 1913. No. 43990 F.

Basic Principles of Ground Water Collection. Charles B. Burdick. A record of the principles bearing on the collection of water from sand and gravel, and how they have been applied. Ills. 4000 w.

Hygiene

Am W-Wks. Assn—June, 1913. No. 44483 N.

Use and Conservation of the Underground Reservoirs of California. Charles H. Lee. Information concerning these subterranean storage reservoirs, their supply and yield, and the sources of avoidable waste. 2500 w. W Engng—Sept., 1913. No. 45236 C.

See also Drainage, under *Construction*.

Hygiene

The Relation of a Pure Water Supply to Chronic Intestinal Tract Infection. Nicholas S. Hill, Jr., and Leon R. Whitcomb. Condensed from a paper before the Am. Pub. Health Assn. Discusses the relation between impure water and auto-intoxication. 3000 w. Eng News—Jan. 30, 1913. No. 39594.

See also Mosquitoes, under *Miscellany*.

Intake Crib

A New Design for Water-Works Intake Crib. W. D. Barber. Outlines the features of the design of the present intake cribs on the Great Lakes and the difficulties encountered, and describes also a new design of crib, combined with submerged intakes. Ills. 5000 w. Eng News—June 19, 1913. No. 42985.

Intakes

The Design and Construction of a River Intake Pipe Line, at Fort Myer, Va., with Special Reference to the Inverted Strainer Used. Leonard S. Doten. Describes extensive improvements. 1000 w. Engng & Con—Dec. 11, 1912. No. 38145.

Methods and Costs of Constructing and Repairing Tunnel and Pipe Line Intakes in Lake Superior, for Copper Mine Stamp Mill Water Supply at Beacon Hill, Mich. Edward Koepel. Read before the L. Superior Min. Inst. Gives the history of the intakes built, including details of design and methods and cost of construction and repairs. 7000 w. Engng & Con—Feb. 26, 1913. No. 40230.

Structural Features of the New Intake Tower, Tunnel, and Screen Chamber of the St. Louis Water Department. Gives general plan of supply and illustrated description of details. 3500 w. Engng & Con—Oct. 29, 1913. No. 46384.

Irrigation

Conference of Irrigation Managers at Bozeman, Montana. Report of matters discussed at the conference and the conditions of modern systems. 3000 w. Eng News—Nov. 7, 1912. No. 37319.

Increasing the Duty of Water. B. A. Etcheverry. Read before the Nat. Irrigation Cong. Discusses losses which produce a low duty, estimating them at 76 per cent of the supply, and methods of

WATER SUPPLY

conservation. 4500 w. Eng Rec—Nov. 2, 1912. No. 37224.

Maintaining Irrigation Canals Subject to Heavy Deposits of Silt. J. C. Allison. Special machinery and methods employed in the Imperial Valley, California, are illustrated and described. 2000 w. Eng Rec—Nov. 16, 1912. No. 37584.

\$3,500,000 for Irrigation. M. D. Henderson. Information concerning a mammoth Pearson project on the Texas plains. 1800 w. Mfrs' Rec—Nov. 14, 1912. No. 37554.

U. S. Irrigation Work in the Northwest. Robert Fletcher. Notes on the remarkable accomplishments of the U. S. Reclamation Service. Ills. 9500 w. Eng News—Nov. 14, 1912. No. 37590.

Electricity and Spray Irrigation. Putnam A. Bates. Brief illustrated description of the raising of water by electric pumps to produce artificial rain. 1200 w. Sci Am—Nov. 2, 1912. No. 37158.

Land Values in Egypt. Sir Hanbury Brown. Reviews the benefits resulting from irrigation and the great increase in the value of the land. 2000 w. Engng, Lond—Nov. 1, 1912. No. 37550 A.

Irrigation. H. M. Goodman. Detailed discussion of irrigation investigations and work, with references to the Dominion Government irrigation belt in Saskatchewan. Ills. 6500 w. Ap Sci—Nov., 1912. No. 38284 C.

Operation and Maintenance of Irrigation Systems. F. H. Newell. Abstract of a paper read before the 20th Nat. Irrigation Cong. Review of progress since 1902, with suggestions. 3500 w. Eng Rec—Nov. 30, 1912. No. 37967.

Irrigation Project on the Price River in Eastern Utah. Brief illustrated description of the work. 2000 w. Eng Rec—Dec. 28, 1912. No. 38578.

Designs for Irrigation Structures. The present number gives plan and description of an outlet gate for the Alfred Davis reservoir of the Turlock Irrigation District, in California. 700 w. Engng & Con—Dec. 25, 1912. Serial. 1st part. No. 38555.

Prewitt Reservoir Project. Illustrated description of work in Colorado involving a diversion dam with a new type of movable flashboard supports and a 3½ mile protected embankment. 3000 w. Eng Rec—Dec. 28, 1912. No. 38572.

Construction Methods on the Medina Valley Irrigation Project, Texas. C. H. Kearny. Illustrated account of rapid progress in building two concrete dams and extensive flumes. 2500 w. Eng Rec—Dec. 7, 1912. No. 38076.

Consult Classification of the Index. See page 9.

Irrigation

WATER SUPPLY

Irrigation

Irrigation in Java (Irrigatie op Java). R. A. van Sandick. Outlines some of the main systems, and brief description of special features. Ills. 6500 w. *De Ingenieur*—Nov 16, 1912. No. 38476 D.

Gibbs' Module for Irrigation Works. Explains the requirements and illustrates and describes a new type intended to meet the conditions. 1200 w. *Engng*—Jan. 17, 1913. No. 39477 A.

Seasonal Duty of Irrigation Water. F. W. Hanna. Gives conclusions based on observations made in the Boise Valley, Idaho. 3000 w. *Eng Rec*—Jan. 25, 1913. No. 39366.

On the Measurement and Division of Water. L. G. Carpenter. Describes some methods adapted to the use of small ditches and laterals and also methods for large ditches. Especially explains the use of the weir. 18500 w. *Colo Agri College*, Bul. 150—June, 1911. No. 39510 N.

Egyptian Irrigation and the Assouan Dam. An illustrated account of what has been accomplished under British influence, with a review of the early conditions. Ills. and Plates. 11000 w. *Engng*—Dec. 20, 1912. No. 38889 A.

Irrigation Pumping in Southern Idaho. E. A. Wilcox. Illustrates and describes several pumping installations, giving suggestions regarding equipment, maintenance and operation. 2500 w. *Elec Rev & W Elect'n*—Jan. 25, 1913. No. 39413.

Ten Years of Government Irrigation Work. Review of the activities of the U. S. Reclamation Service since the passage of the Newlands Act. 3500 w. *Eng Rec*—Feb. 1, 1913. No. 39647.

Irrigation in the Sudan. Percy F. Martin. Maps and description of this great work, the difficulties and present progress. 2800 w. *Engr, Lond*—Jan. 31, 1913. Serial, 1st part. No. 39813 A.

Duty of Water for Irrigation. On the amount and character of water losses as determined by extensive studies in Idaho. 3000 w. *Eng Rec*—March 15, 1913. No. 40647.

Irrigation Surveys and Water Powers. Information from a recent report concerning work in progress in Alberta and Saskatchewan. 2500 w. *Can Engr*—March 20, 1913. No. 40785.

The Reclamation of Ancient Babylonia by Irrigation. Edgar J. Banks. An account of proposed reclamation at a cost of \$60,000,000. Ills. 1700 w. *Eng News*—March 6, 1913. No. 40355.

Twin Falls—Oakley Irrigation Project. A. M. Korsmo. Illustrated description of the Carey Act irrigation project in south-

ern Idaho; especially the construction of the main dam. 3500 w. *Eng News*—March 13, 1913. No. 40657.

Irrigation on the Wind River Indian Reservation. A. P. Poorman. Describes projects in Wyoming, giving costs. 2500 w. *Indiana Engng Soc*—1912. No. 41741 N.

Drainage of Irrigated Lands on the Minidoka Project, Idaho. Percival M. Fogg. Explains this drainage problem, as it has developed and is being solved. 5500 w. *Jour of Idaho Soc of Engrs*—June, 1912. No. 41728 N.

Minidoka Power & Pumping System. Barry Dibble. Illustrated description of the largest pumping system that has been undertaken. 3000 w. *Jour of Idaho Soc of Engrs*—June, 1912. No. 41725 N.

Methods and Devices for Measuring Water for Irrigation. Albert Eugene Wright. Explains methods of irrigation measurements and the devices used. 5000 w. *Engng & Con*—May 21, 1913. No. 42309.

Porto Rico Irrigation Service. W. L. Squire and F. H. Knapp. Map and detailed description of the project. 6500 w. *Cornell Civ Engr*—May, 1913. No. 42437 C.

Reinforced-Concrete Chutes on Boise Project. F. W. Hanna. Describes the design, construction and operation of five of the larger of the open chutes. Ills. 2000 w. *Eng Rec*—May 3, 1913. No. 41849.

What Is the Matter With Irrigation? Editorial discussion of why irrigation is unprofitable. 3000 w. *Eng News*—June 12, 1913. No. 42814.

Irrigation Works in India. Sir John Benton. An account of the State irrigations works in India, those now in operation and those under construction. 18500 w. *Jour Soc of Arts*—June 13, 1913. No. 43130 A.

The Storage of Flood Waters for Irrigation. A study of the supply available from Southern California streams. A. M. Strong. Map and diagrams. 3500 w. *Pro Am Soc of Civ Engrs*—May, 1913. No. 42907 F.

Concrete Pipe and Overflow Basins for Distributing Irrigation Water. Eugene C. Mills. Illustrates and describes details of the system used on the Sacramento Valley project. 2500 w. *Eng Rec*—June 14, 1913. No. 42823.

Construction of Irrigation Canal Systems From an Operation Standpoint. P. M. Fogg. Calls attention to features deserving attention during the construction. 1500 w. *W Engng*—June, 1913. No. 43189 C.

Irrigation

WATER SUPPLY

Mains

Irrigation in Egypt and the Nile River Dams (L'irrigazione in Egitto e le dighe sul Nilo). Luigi Luiggi. General notes on Egyptian practice; the Assuan dam and its anticipated results. Ills. 6000 w. Ann della Soc d Ing e d Arch Ital—May 16, 1913. No. 43091 E.

Irrigation in the Plains of Konia in Asia Minor (De irrigatiewerken in de vlakke von Konia in Klein-Azië). R. G. Hoeffelman. A detailed study of the customs employed in ancient and modern times. Ills. Serial, 1st part. 19000 w. De Ingenieur—June 28, 1913. No. 43550 D.

The Cost of Reclamation Service and Other Irrigation Projects in Colorado. John E. Field. Criticism of recently published articles supposedly based on information furnished by the U. S. Reclamation Service. Also reply by F. H. Newell. 8500 w. Eng News—Aug. 21, 1913. No. 44574.

Irrigation and River Control in the Colorado River Delta. Continued discussion of H. T. Cory's paper. 16500 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44789 F.

Irrigation of Santa Cruz Valley. M. C. Hinderlider. Illustrated account of the recovery of underground water in Arizona by wells and pumps. 3000 w. Eng Rec—Aug. 23, 1913. Serial, 1st part. No. 44546.

Irrigation Project of the Sacramento Valley Irrigation Company. R. A. Balzari. Illustrates and describes the Head Gate plant, one of the largest electrically driven irrigation plants in California. 1800 w. W Engng—Aug., 1913. No. 44386 C.

The Storage of Flood-Waters for Irrigation; A Study of the Supply Available from Southern California Streams. Discussion of the paper by A. M. Strong. 1200 w. Pro Am Soc of Civ Engrs—Sept., 1913. No. 45526 F.

Irrigation and River Control in the Colorado River Delta. Continued discussion of H. T. Cory's paper. 5000 w. Pro Am Soc of Civ Engrs—Sept., 1913. No. 45522 F.

A Study of Irrigation Heads in the Modesto and Turlock Irrigation Districts, California. Statements from a report by P. C. Berkefeldt on a study of actual practice. 2500 w. Eng News—Sept. 11, 1913. No. 45071.

Irrigation in Oregon. John H. Lewis. Read before the W. Can. Irr. Assn. Explains the need of irrigation and the value of water; the water laws, administrative problems, and the work the State

is attempting. 3000 w. Can Engr—Sept. 11, 1913. No. 45126.

Rapid Construction on Medina Valley Irrigation Project in Texas. Terrell Bartlett. Mainly an illustrated account of the construction of a concrete dam of large size in the short time of one year. 2500 w. Eng News—Sept. 11, 1913. No. 45073.

The Relative Efficiency of Talus Slopes and Forests in Conserving Snow for Irrigation. J. E. Church, Jr. Gives a letter from G. L. Shumway, discussing points brought forward. 3000 w. Engng & Con—Oct. 15, 1913. No. 45893.

Main Canal of Medina Irrigation Project. Illustrated description of two river crossings effected by reinforced-concrete inverted siphons, and a drop made by concrete-lined chute. 2000 w. Eng Rec—Oct. 18, 1913. No. 45939.

See also Laboratories, under *Measurement*; Dams, Pipe Lines and Snow Conservation, under *Water Supply*, and Colorado River, under *Waterways and Harbors*.

Jersey Island

Water Supply of Jersey. Alfred J. Jenkins. Read before the Inst. of W. Wks. Engrs. Illustrated description of the supply on this island, having a population of 52,000. 2500 w. Surveyor—June 13, 1913. No. 43135 A.

Leicester, Eng.

Leicester Water Supply from the Derwent Valley. Details, drawings, illustrations and descriptions of this work. 2000 w. Engr, Lond—Dec. 20, 1912. No. 38897 A.

Leptomitus

Leptomitus in Drinking Water. Robert C. Sweetser. Gives experience of a town in Massachusetts, and also in other places. Discussion. 3500 w. Jour N Eng W-Wks Assn—June, 1913. No. 43991 F.

Log Flumes

The Design of Log Flumes. J. P. Martin. Discusses engineering principles involved in fluming. Showing that with the aid of diagrams the feasibility of fluming can be determined in a general way. 4000 w. Eng News—Nov. 14, 1912. No. 37592.

Los Angeles

See Aqueducts, under *Water Supply*.

Mains

River Crossings for Water Mains at Fort William. Drawings and description of the shaft and tunnel system made necessary to increase the water supply. 1000 w. Can Engr—Aug. 14, 1913. No. 44397.

Meters

WATER SUPPLY

Pipe Flow

Meters

Characteristics of Cup and Screw Current Meters, Performance of These Meters in Tail-Races and Large Mountain Streams; Statistical Synthesis of Discharge Curves. B. F. Groat. Gives Conclusions drawn from tests. 7000 w. Pro Am Soc of Civ Engrs—Dec., 1912. No. 39288 F.

Selling Water by Current Meter Measurement. J. C. Allison. Map and description of the irrigation system of the California Development Co., relating the silt and other difficulties, and describing the use of current meters for water measurements, and the current meter rating flume at Calxico. 4000 w. Eng News—Jan. 9, 1913. No. 38949.

An Argument for Water Meters in Chicago from the Standpoint of the Individual Householder. T. C. Phillips. 1500 w. Engng & Con—Jan. 1, 1913. No. 38770.

Characteristics of Cup and Screw Current Meters, Performance of These Meters in Tail Races and Large Mountain Streams; Statistical Synthesis of Discharge Curves. Discussion of the paper by B. F. Groat. 4500 w. Pro Am Soc of Civ Engrs—Feb., 1913. No. 40173 F.

The Results Accomplished in Kalamazoo, Michigan, by the Installation of Water Meters, with Special Reference to "Steals" from Fire Sprinkler Lines. 2000 w. Engng & Con—Feb. 5, 1913. No. 39700.

Water Meters in St. Louis. Discusses special features of different makes; deposits in meters and preventing and removing them, and related subjects. Ills. 3000 w. Munic Jour—Sept. 18, 1913. No. 45244.

See also Stream Flow, under *Water Supply*.

New Jersey Rules

See same heading, under *Municipal*.

Ottawa

Ottawa Water Supply Project. Brief descriptions of the possible sources of supply, with extracts from the report of Sir Alex. Binnie. 4500 w. Can Engr—Oct. 16, 1913. No. 45955.

Panama

Panama Water Supply and Purification System. Arthur T. Nabstedt. Reviews the peculiar problems, the effect of tropical conditions, describing the purification works. Ills. 4500 w. Eng News—Oct. 2, 1913. No. 45650.

Paris

The Water Supply of Paris. Explanation of the supply, with bacteriological analyses. 1000 w. Engng—Aug. 15, 1913. No. 44727 A.

Philippines

Gravity Water Supply at the City of Manila, Philippine Islands. H. E. Keeler. An interesting account of the early and present water supply systems, and brief reference to the excellent sewer system. 2000 w. Am W-Wks Assn—June, 1913. No. 44480 N.

Pipe

See Reinforced Concrete, under *Materials of Construction*.

Pipe Cleaning

Cleaning Cincinnati Water Mains. J. A. Hiller. Illustrates and describes methods and results, giving cost. 1500 w. Munic Jour—Nov. 28, 1912. No. 37935.

Pipe Corrosion

Mill Scale as a Cause of the Pitting of Steel Pipes. George C. Whipple and Melville C. Whipple. Condensed from a paper read before the Int. Chem. Cong. Reports investigations and states conclusions. 4500 w. Eng News—Nov. 7, 1912. No. 37317.

Mill Scale as a Cause of the Pitting of Steel Pipes. George C. Whipple and Melville C. Whipple. Abstract of paper before the Int. Chem. Cong. Gives results of investigations and conclusions. 4000 w. Mech. Engr—Dec. 13, 1912. No. 38395. A

See Corrosion, under *ELECTRICAL ENGINEERING, Electro-Chemistry*.

Pipe Flow

Experimental Determination of Loss of Head Due to Sudden Enlargement in Circular Pipes. W. H. Archer. A summary of experimental data and computations obtained in a series of tests to determine the loss of hydraulic head due to sudden enlargement in cross-section. 4000 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41312 F.

Studies of Coefficient of Friction in Reinforced-Concrete Pipe, Umatilla Project, Oregon. Herbert D. Newell. Reports results of some of these pipe lines in service, giving experiments made to determine the coefficient of friction. 1500 w. Eng News—May 1, 1913. No. 41864.

Experiments on Stream Action in Broadened and Narrowed Channels (Versuche über die Strömungsvorgänge in erweiterten und verengten Kanälen) Heinrich Hochschild. Exhaustive studies on flow action in pipes, etc. Ills. 4500 w. Zeit des Ver deutscher Ing—April 26, 1913. No. 42144 D.

A Mechanism for Metering and Recording the Flow of Fluids Through Venturi Tubes, Orifices, or Conduits by Integrating the Velocity Head. J. W. Ledoux. Considers briefly the fundamental principles of the subject and de-

Pipe Freezing

scribes a form of meter register. Ills. 4500 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42911 F.

See also Fire Streams, under *Water Supply*.

Pipe Freezing

Electrical Device for Thawing Out Frozen Water Pipes. Charles P. Hoover. Illustrated description of a portable outfit used in Columbus, O. 1500 w. Eng Rec Feb. 22, 1913. No. 40105.

Pipe Laying

Methods of Laying and Repairing a 30-in. Submerged Water Main at Bridgeport, Conn. From a paper by Fred. S. Wardwell read before the Conn. Soc. of Civ. Engrs. Diagrams and description. 900 w. Engng & Con—Nov. 27, 1912. No. 37922.

Pipe Lines

The Horsepower of a Pipe Line. R. S. Bayard. A study of the relation between static and friction head, flow and velocity. 2000 w. Power—Dec. 31, 1912. No. 38696.

New 60 Inch Water Supply Conduit at Denver. Illustrated description of a long steel and wood stave pipe line provided with special angle wells instead of short radius curves. 1800 w. Eng Rec—Jan. 18, 1913. No. 39186.

Experience with Wood-Stave Pipe in Irrigation. Gives experience on the Yakima project, in Washington, reporting on both wire-wound and banded pipe. Ills. 3500 w. Eng News—Feb. 6, 1913. No. 39707.

Nisqually River Pipe-Line Bridge. Illustrated description of the design and erection at La Grande, Washington, of a 200-ft. span arch carrying a 10-ft. water-power main. 1500 w. Eng Rec—March 22, 1913. No. 40767.

Pipe Obstructions

Animal Growth in Water Pipes. Samuel C. Chapman. Information concerning the organisms often found troublesome. 4000 w. Engr, Lond—June 20, 1913. No. 43396 A.

Pipe Protection

Protecting Vent Pipes from Frost. James Smith. Explains a scheme devised to protect soil pipe outlets from being closed by frost in cold climates. Ills. 1500 w. Met Work—Nov. 15, 1912. No. 37555.

Pipes

Cost of Constructing by Contract Water Pipe Extensions Aggregating 17.7 Miles in Chicago in 1912. 12800 w. Engng & Con—May 14, 1913. No. 42089.

The Theory of Loads on Pipes in Ditches and Tests of Cement and Clay Drain Tile and Sewer Pipe. A. Marston

WATER SUPPLY

and A. O. Anderson. Ills. 181 pp. Bul No. 31, Iowa State College of Agri and Mech Arts—Feb., 1913. No. 43757 N.

Insulation of Joints in Pipe Lines. William R. Conard. Describes the laying of pipe in an endeavor to get a line as nearly proof as possible against electrolytic action. Ills. Discussion. 1000 w. Jour N Eng W-Wks Assn—June, 1913. No. 43989 F.

The Economics of Pipe Line Diameters. C. W. Harris, in Pro. of the Pacific N-W. Soc. of Engrs. Discusses a method for determining economical pipe line construction. 3500 w. Engng & Con—Aug. 27, 1913. No. 44776.

The Theory of Bends in Pipes and Canals (Zur Theorie der Rohr- und Kanal-Krümmer). Richard Grammel. A study of the flow of liquids around bends, with theoretical sections. Ills. Serial, 1st part. 2400 w. Zeit f d ges Turbinwesen—July 30, 1913. No. 44670 D.

Pitot Tube

See same heading under *Measurement*.

Plumbing

The Plumbing in the New Post Office at Jersey City, N. J. Harold L. Alt. Illustrated detailed description. 2500 w. Dom Engng—Nov. 2, 1912. No. 37258.

The Effect of Intercepting Traps in House Drainage. Edward Willis. Discusses the origin of the intercepting trap, its disadvantages and advantages. General discussion. 5000 w. Surveyor—Dec. 13, 1912. No. 38393 A.

Sanitary Equipment of a Loft Building. Illustrates and describes methods of installing a complicated system of piping in a tall building with small ground area. 1800 w. Met Work—Jan. 17, 1913. No. 39206.

Plumbing in Greenpoint Hospital, Brooklyn. Illustrates and describes an example of modern methods. 3500 w. Dom Engng—Feb. 22, 1913. No. 39993.

Plumbing in Hotel Statler, Cleveland. Illustrated description of sanitary equipment requiring over 3,000 plumbing fixtures. 2500 w. Met Work—June 13, 1913. No. 42794.

Plumbing in Milwaukee Savings Bank. Illustrates and describes the sanitary conveniences, drainage system for rain water and wastes from fixtures. 1200 w. Met Work—July 18, 1913. No. 43768.

Pollution

Conference on Pollution of Lakes and Waterways. A number of short papers read at a joint meeting at Cleveland, Ohio. 5000 w. Eng Rec—Nov. 2, 1912. No. 37222.

Pollution

Pollution

Some Recent Examples of the Pollution of Public Water Supplies. John C. Thresh. Read before the Inst. of Water Engrs. Explains some causes of contamination. 3500 w. Surveyor—Dec. 20, 1912. No. 38874 A.

Sanitary Protection of the Water Supplies Taken from the Great Lakes. George C. Whipple. Read at the Int. Cong. of Ap. Chem. Shows the effect of contaminated lake water on the public health and the ways in which the problem may be solved under different local conditions. Also discussion. 14000 w. Pro Engrs' Club of Phila.—Jan., 1913. No. 39961 D.

Studies of Fish Life and Water Pollution. H. W. Clark and George O. Adams. Read before the Int. Cong. of Ap. Chem. Discusses results of investigations made at the Lawrence Experiment Station. 3000 w. Eng News—Feb. 13, 1913. No. 39860.

Studies of Fish Life and Water Pollution. H. W. Clark and George O. Adams. Extracts from a paper read at the Cong. of Ap. Chem. A report of experiments at the Lawrence Experiment Station. 2500 w. Surveyor—May 30, 1913. No. 42771 A.

The Chemical Measure of Stream Pollution and Specification for Sewage Effluents. Earle B. Phelps. Proposed formula for use in investigation of pollution and comparison of calculated and actual percentages. 5000 w. Am Jour Pub Health—June, 1913. No. 44001 C.

Practical and Just Legislation Relating to Stream Pollution. Charles Saville. Suggestions for boards of control based upon the principles of the Emscher Federation in Germany. 6000 w. Am Jour Pub Health—June, 1913. No. 44004 C.

Chemical and Bacterial Condition of Rivers Above and Below the Sewage Effluent Outfall. J. E. Purvis and A. E. Rayner. From a paper read at the Exeter Cong. of the Roy. San. Inst. Reports investigations of Cam River. 1200 w. Surveyor—Aug. 15, 1913. No. 44717 A.

How a Public Water Supply Was Polluted by a Private Fire Service—and the Consequences. R. J. Thomas. An account of an occurrence at Lowell, Mass., in July, 1903. 1600 w. Am W-Wks Assn—June, 1913. No. 44481 N.

See also Sanitation, under *Water Supply*.

Preliminaries

A Discussion of Some Common Faults in the Engineering Preliminaries for Water Power and Water Supply Developments. Robert E. Horton. From a paper

WATER SUPPLY

before the Mich. Eng. Soc. A statement of some common faults in the engineering preliminaries for projects of the class named. 2500 w. Engng & Con—Feb. 5, 1913. No. 39704.

Public Baths

Water Supply for Public Baths. C. J. Yorath. Describes a scheme where a supply of water was obtained by sinking a deep well for baths in London. Ills. 2500 w. Engr, Lond—April 18, 1913. No. 41774 A.

Pumping Plants.

Practical Methods for Obtaining High Efficiency in Water Works Pumping Plants. From a paper by Seabury G. Pollard, read before the Ill. Water Sup. Assn. Outlines methods of obtaining high efficiency in the operation of such plants. 3500 w. Engng & Con—March 19, 1913. No. 40732.

Economy Factors in Power and Pumping Plants. Charles Brossmann. Discusses faults and the factors affecting the economy in the operation of plants. 3000 w. Indiana Engng Soc—1912. No. 41740 N.

Economical Operating Methods and the Study of Economies in Water Works Pumping Plants. From a paper by C. H. Benjamin before the Indiana San. & Water Sup. Assn. A study of possible economies and preventable losses. 1700 w. Engng & Con—April 23, 1913. No. 41591.

Pumping Stations

New Diesel-Driven Pumping Installation at Rugby Water-Works. R. A. Pfeleiderer. Read before the Rugby Engng. Soc. Gives a brief description of the general system of water supply and discusses the new pumping installation. Ills. 5500 w. Mech. Engr—Dec. 20, 1912. No. 38883 A.

Efficiency in the Pumping Station. Seabury G. Pollard. Brief consideration of operating standards, structural defects, etc. 2000 w. Munic Engng—May, 1913. No. 42414 C.

Municipal Pumping Plants. F. Noel Taylor. Discusses the general arrangement of the plant, information required when designing a station, economical maintenance, &c. 1500 w. Prac Engr—June 12, 1913. Serial. 1st part. No. 43133 A.

Lazwell Drainage Pumping Plant. Illustrated description of a plant used to drain an area of about fifty thousand acres of swamp land. 1200 w. Power—June 17, 1913. No. 42860.

The Pumping Station of Old Emscher ("Pumpwerk Alte Emscher") Ernst Mautner. A description of the circular

Purification

reinforced concrete building located in the bed of the reservoir. Ills. Serial. 1st part. 2400 w. Beton u Eisen—May 7, 1913. No. 43020 E.

Data on the Cost of Pumping in Water Works Steam Pumping Stations. Kenneth F. Lees. Read before the Conn. Soc. of Civ. Engrs. Discussion, with data, on the cost of pumping water in steam plants. 1700 w. Engng & Con—Aug. 27, 1913. No. 44778.

Power for Pumping Derived from Refuse. E. H. Foster. Considers briefly the different methods of disposing of city waste, favoring the mixed collection. Ills. 1000 w. Am W-Wks Assn—June, 1913. No. 44479 N.

Details of an Automatic Pumping Station at Farmington, Mich. A. R. Cary. Read before the Mich. section of the Nat. Elec. Lgt. Assn. Brief description. 1200 w. Elec Rev & W Elect'n—Aug. 23, 1913. No. 44558.

Comparative Economy of Producer Gas and Steam for Pumping Stations. Gives unit costs derived from records covering 5 years' operation at two plants. 2500 w. Engng & Con—Sept. 6, 1913. No. 44995.

Purification

A Discussion of the Vagaries of Present Specifications Governing the Purchase of Lime for Water Purification—Recommended Clauses. From a paper by W. F. Monfort, before the Cent. States W.-Wks. Ass'n. Calls attention to essential facts governing lime purchases. 2500 w. Engng & Con—Nov. 13, 1912. No. 37566.

Standards of Purity for Rivers and Waterways. Report of a Committee of the Nat. Assn. for Preventing the Pollution of Rivers and Waterways. 1800 w. Eng News—Oct. 31, 1912. No. 37212.

Water Purification and Its Application to Industrial Uses H. Royal-Dawson. Discusses conditions required for drinking water, for industrial purposes, and methods of purification. 3500 w. Chem Engr—Nov., 1912. No. 37918 C.

Water Purification for the Rotterdam Water Supply (De waterzuivering door het waterwerk der gemeente Rotterdam). A. H. van Delden. Showing results of microscopic bacteria tests before and after filtration. Ills. 6500 w. De Ingenieur—Nov. 30, 1912. No. 38478 D.

Experiments on Water Purification. Notes from a recent report of the Massachusetts State Board of Health describing work during 1911 with several different methods of filtration. 4500 w. Eng Rec—Jan. 11, 1913. No. 38960.

WATER SUPPLY

Purification

Recent Advances in the Science of Water Purification. Adolph Kenna. Read before the Inst. of Water Engrs. Discusses some of the latest methods of purification. 6000 w. Surveyor—Dec. 27, 1912. No. 38376 A.

Use of Chloride of Lime with Pressure Filters. Francis D. West. Reports experience at Philadelphia in purifying a water subject to sudden variations in character. Ills. 2000 w. Eng Rec—Jan. 18, 1913. No. 39187.

Water Purification at Philadelphia during 1911. Information from the annual report of Fred C. Dunlap. 2500 w. Eng Rec—Jan. 25, 1913. No. 39367.

Lawrence Experiment Station Studies in the Purification of Water. Gives results of experimental work during 1911. 4800 w. Engng & Con—Jan. 8, 1913. No. 38938.

Modern Methods of Water Purification. John C. Thresh. Read before the Inst. of Munic. & Co. Engrs. Examines the various processes in use, giving results of investigations, including ultra-violet rays. 5000 w. Surveyor—Feb. 14, 1913. No. 40122 A.

Different Kinds of Clarifying Plants (Die verschiedenen Arten von Kläranlagen). Herr Berkenkamp. Brief outlines of small water purifying plants available for use in mining camps, with approximate costs. 2100 w. Glückauf—Jan 11, 1913. No. 40012 D.

A Discussion of the Problems Connected with the Effort to Establish Standards for the Hygienic Purity of Public Water Supplies. Joseph W. Eilms. Paper before the Indiana San. & Water Supply Assn. 1800 w. Engng & Con—March 5, 1913. No. 40349.

The Present Condition of Small Water Purification Plants in Illinois—Faults in Design and Operation. Ralph Hilscher. Read before the Ill. Water Sup. Assn. Describes the present condition of small water filtration plants, discussing their faults of design and operation. 1600 w. Engng & Con—March 19, 1913. No. 40730.

Purifying Water by Sedimentation and Filtration. Edward K. Hammond. Describes the method used in the plant at New Milford, N. J. Ills. 2500 w. Chem Engr—March, 1913. No. 40925 C.

The Absorption of Oxygen by De-aerated Water. Earl B. Phelps. A discussion of a report by Dr. W. E. Adeney on the subject of re-aeration of polluted tidal waters. 4500 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41310 F.

Conditions of Small Water Purification Plants in Illinois. Ralph Hilscher.

Consult Classification of the Index. See page 9.

Purification

Abstract of a paper read before the Ill. Water Sup. Assn. Discusses faults of these plants. 1500 w. Eng News—April 10, 1913. No. 41161.

The Biological Purification of Waste Waters by the "Perfect Septic Tank" (L'épuration biologique des eaux usées par la "fosse septique complétée"). F. Bussière. Principles of biological purification and detailed description of design and action of "La fosse septique complétée," and its application. Ills. 3500 w. Genie Civil—April 12, 1913. No. 41530 D.

The Efficiency of Coagulating Basins. W. F. Monfort. Read before the Illinois Water Sup. Assn. Description of the St. Louis installation and its working. 4000 w. Can Engr—May 8, 1913. No. 41969.

Report on the Application of Ozone to Water Purification. Russel Spaulding. An account of the results obtained in French, German and Russian installations where rivers are used as the source of water supply. Ills. 6000 w. N. Y. State Dept. of Health. 43019 N.

An Example of the Purchase Under Specifications of Chemicals for Use in Water Purification. Gives the substance of a form of contract and specifications prepared by the Columbus, O., Water Department 1600 w. Engng & Con—July 23, 1913. No. 43872.

Dry Feed for Chemicals Used in Water Purification. Allen Hazen. Explains the advantages of dry feed and describes an apparatus designed by the author for applying pulverized alum and hypochlorite to water by means of a screw conveyor driven by a small water wheel. Ills. 1200 w. Eng Rec—July 19, 1913. No. 43788.

Storing Lime for Water Softening. Charles P. Hoover and C. J. Clarke. Illustrated description of the new bins and weighing apparatus at the Columbus water purification works. 2500 w. Eng Rec—July 5, 1913. No. 43468.

The Absorption of Oxygen by De-aerated Water. Discussion of the paper by Earle B. Phelps. 3000 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44792 F.

Pure and Wholesome Water. George A. Johnson. Deals with the composition of water, the value of sanitary water analysis, temperature, turbidity, color, hardness, physical features, bacteria, standard of purity, &c. 11000 w. Am W-Wks Assn—June, 1913. No. 44474 N.

Eliminating Hypochlorite Tastes. From a paper by Dr. Arthur Lederer and Frank Bachmann, read before Ill. Water Sup. Assn. Considers the effect of stor-

WATER SUPPLY

age and aeration, neutralization with sodium sulphite and thiosulphate. 1600 w. Munic Jour—Aug. 21, 1913. No. 44536.

The Bacteria Count on Gelatin and Agar Media and Its Value in Controlling the Operation of Water Purification Plants. James M. Caird. Reports special investigations at several purification plants to learn the comparative results of the gelatin and agar media. 3000 w. Am W-Wks Assn—June, 1913. No. 44478 N.

See also Filtration, and Sterilization, under *Water Supply*.

Rates

A Study Made to Determine Equitable Water Rates for the City of St. Louis, Mo. A study of equitable rate determination, prepared by Edward E. Wall, and published as part of a report to the Board of Public Improvements. 5000 w. Engng & Con—May 28, 1913. No. 42517.

Rates and Rate-Making Under Wisconsin Public Utility Law. Halford Erickson. Abstract of paper read before the Am W-Wks Assn. Outlines the cost method of rate-making. 2500 w. Eng Rec—July 12, 1913. No. 43658.

Some Features of Engineering Appraisalment of Water Works Properties, with Special Reference to the Appraisements for Rate Readjustment at Chilli-cothe, O., and Texarkana, Ark., and Texas. Phillip Burgess. Read before the Central States W-Wks. Assn. Deals chiefly with some features incident to the appraisements. 3500 w. Engng & Con—Sept. 3, 1913. No. 44973.

Reforestation

The Proposed Reforestation of the Cedar River Watershed, Seattle Water-Supply. Based on a report by R. H. Ober and H. C. Johnson. Illustrated description of the watershed and Cedar Lake, and the proposition of reforesting. 3500 w. Eng News—Sept. 4, 1913. No. 44987.

Proposed Methods and Estimated Unit Costs of Reforesting the Cedar River Watershed of the Seattle Water Works. A study of costs with conclusions. 6000 w. Engng & Con—Oct. 22, 1913. No. 46132.

Reservoir Cleaning

Cleaning a Large Settling Reservoir. Joseph W. Ellms. Illustrates and describes methods of flushing out with streams from hose, three and one-half years' accumulation of mud. 3000 w. Eng Rec—June 21, 1913. No. 43110.

Reservoir Failure

Failure of the City Reservoir Wall, Nashville, Tenn. Howard M. Jones. Il-

Reservoirs

Illustrated account of the failure that occurred at midnight, Nov. 4, 1912. 1800 w. Eng News—Nov. 14, 1912. No. 37594.

Reservoirs

New Reinforced Concrete Reservoir at Council Bluffs. Brief illustrated description of a 3-compartment, 8,000,000-gal. settling reservoir with sloping floors. 1500 w. Eng Rec—Jan. 11, 1913. No. 38955.

The Design of the 5,000,000-gal. Reinforced Concrete Water Works Reservoir for La Crosse, Wis. Describes and illustrates the principal features, and gives a summary of the discussion of the economics of water storage. 2500 w. Engng & Con—Jan. 1, 1913. No. 38771.

Partial Failure of Reservoir Lining, Johnson City, Tenn. D. R. Beeson. Illustrated account of the failure of a concrete lining on Jan. 10, allowing the contents of the reservoir to escape. 1200 w. Eng News—Jan. 30, 1913. No. 39596.

Covered Concrete Reservoir at Lowell, Mass. Illustrated description. 1600 w. Eng Rec—Feb. 15, 1913. No. 39867.

Design for Increasing Depth of Brick Reservoir by Means of Reinforced Concrete, and Design of New Circular, Open, Reinforced Concrete Reservoir for Sioux City, Iowa. Explains conditions and describes the proposed enlargement. Ills. 2000 w. Engng & Con—Feb. 12, 1913. No. 39832.

How to Repair the Nashville Masonry Reservoir. From report by Rudolph Hering, dealing with the proposed repair to the reservoir, which failed Nov. 4, 1912. Ills. 2000 w. Eng News—Feb. 6, 1913. No. 39711.

The Cause of the Failure of the Nashville Water Works Reservoir Wall—Nature of Recommended Repairs and Improvements. From a recent report by Rudolph Hering. 3000 w. Engng & Con—Jan. 29, 1913. No. 39581.

The Chingford Reservoir of the Metropolitan Water Board. Illustrated description of this new reservoir in the Lea Valley, impounding 3000 million gallons. Plate. 2500 w. Engng—March 14, 1913. No. 40822 A.

The New Reservoir at Chingford. Illustrated detailed description of this great engineering work in the Lea Valley, with related information. 2 plates. 6000 w. Engr, Lond—March 14, 1913. Serial. 1st part. No. 40831 A.

The Chingford Reservoir near London and the Humphrey Gas-Operated Hydraulic Pumps (Le réservoir de Chingford, près de Londres, et les pompes hydrauliques à gaz système Humphrey) Ch. Dantin. A brief description of the

WATER SUPPLY**Reservoirs**

plant, and the pump operation. Ills. 2400 w. Genie Civil—May 3, 1913. No. 42195 D.

A Notable Reservoir for Flood Control in Germany. Kenneth C. Grant. Illustrated description of a recently completed dam in Silesia, built by the Prussian Government—the largest dam in Europe. 1600 w. Eng News—April 3, 1913. No. 41068.

Miami and Erie Canal Feeder Reservoirs During Ohio Floods. Illustrates and describes measures taken to protect embankments during high water. 800 w. Eng Rec—April 5, 1913. No. 41117.

Ohio Reservoirs During the March Floods. Morris Knowles. Information concerning the heavy precipitation and its effects on earth embankments. 4000 w. Eng Rec—April 19, 1913. No. 41358.

The Design and Construction of a 2,000,000-Gal. Circular, Covered, Reinforced Concrete Reservoir at Fort Dodge, Iowa. C. T. Harding. Describes a reservoir for storing water from artesian wells. Ills. 1500 w. Engng & Con—May 21, 1913. No. 42312.

Improvements in the Georgetown Reservoir With Special Reference to Novel Form of Reinforced Concrete Baffle Wall. Drawings and description of details of the baffle wall, and of the remodeling work. 1200 w. Engng & Con—June 11, 1913. No. 42798.

The Prewitt Reservoir Proposition. J. C. Ulrich. Illustrated description of a development for the purpose of increasing the effective water supply of the South Platte Valley in the vicinity of Sterling, in the interest of the beet-sugar industry. 3500 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42909 F.

A Reinforced Concrete Reservoir. Alexander Potter. Read before the Am Wks Assn. Illustrated description of a circular reinforced concrete reservoir 200 ft. in diameter and 26 ft. deep, with side wall wholly above the ground, built at Muskogee, Okla. 5000 w. Con Rec—July 16, 1913. No. 43815.

Construction of the Kamloops Reservoir. N. M. Hall. Describes work in British Columbia. Ills. 2000 w. Con Rec—July 23, 1913. No. 43870.

New Reservoirs in Italy and Sardinia. Maps and description of conditions and the scheme about to be carried out. 1800 w. Engr, Lond—July 18, 1913. No. 43972 A.

The Effect of Proposed Storage Reservoirs on Stream Flow and Water Power on the Lower Chippewa River, Wisconsin. Clinton B. Stewart. Gives results of study showing the benefit and cost.

Residence Supply

1500 w. Eng News—Aug. 7, 1913. No. 44249.

Building Tor Hill Reservoir, Regina. R. O. Wynne-Roberts. Describes the position and capacity, the excavations and embankments, details of the structure, method of operation, and gives general information. Ills. 2500 w. Con Rec—Aug. 27, 1913. No. 44864.

See also River Regulation, under *Waterways and Harbors*.

Residence Supply.

Modern Methods of Residence Water Supply. Illustrates and describes details of pneumatic water supply tanks, pumps and motors with the methods of installation and operation. 1200 w. Met Work—March 7, 1913. Serial. 1st part. No. 40361.

Review of 1912

Water Supply in 1912. A review of the year's progress. 3500 w. Engr, Lond—Jan. 3, 1913. No. 39166 A.

Rotterdam

Arrangement of the Rotterdam Water-Works (De inrichting van het Rotterdamsche Waterwerk). P. Huffnagel. Describes supply source, reservoirs, distributing system, filter plant, etc. Ills. 12000 w. De Ingenieur—Nov. 23, 1912. No. 38477 D.

See also Purification, under *Water Supply*.

Run-Off

See Storm Sewers, under *Municipal*.

San Francisco

A Notable Water Supply Report. Abstract of a report by John R. Freeman, on the water supply for San Francisco and neighboring cities. Also "Summary of Hearing Before Secretary Fisher on the Hetch Hetchy Water Supply. John R. Freeman. Ills. 9000 w. Eng News—Dec. 26, 1912. No. 38594.

The San Francisco Water Supply. Map showing location of possible supplies, with explanation of the rival schemes and difficulties. 3500 w. Engng—April 11, 1913. No. 41389 A.

Sanitation

The Sanitary Control of the Ruhr River, Germany. Richard H. Gould. Gives the most important points of a proposed law and the work undertaken. 1200 w. Eng News—Dec. 19, 1912. No. 38335.

The Public Control of Non-Navigable Streams from a Sanitary Standpoint. H. N. Ogden. Detailed discussion of riparian rights and the methods of control to secure the quality of streams, proposing a plan of control by river districts. General discussion. 12000 w. Jour Cleveland Engng Soc—Jan., 1913. No. 39395 D.

WATER SUPPLY**Snow Conservation**

The Sanitary Survey of the Ohio River Bordering Indiana. J. A. Craven. General remarks on stream pollution and its problems, with details of the work on this portion of the Ohio River. 3500 w. Indiana Engng Soc—1912. No. 41734 N.

See same heading, under **MINING AND METALLURGY, Mining**.

Saskatchewan.

The Moose Jaw Water Supply. P. Gillespie. Describes works consisting of an infiltration gallery, terminating in a main well over which is constructed a head-works pumping station, a pressure main, a headworks reservoir of 500,000 gallons capacity, a gravity main 96,000 ft. long, etc. Ills. 3500 w. Ap Sci—Feb., 1913. No. 40388 C.

Seepage

Seepage Losses from Earth Canals. E. A. Moritz. Discusses unpreventable losses, giving data on several hundred miles of canals, and diagram for estimating. 5000 w. Eng News—Aug. 28, 1913. No. 44882.

Settling Basin

Settling Basin at Lexington, Ky. H. W. Southard. Describes a recent addition to the plant to prevent trouble from algae growths and turbidity. Ills. 2000 w. Munic Jour—June 12, 1913. No. 42889.

Silt Deposits.

Method of Estimating the Probable Volume of Silt Deposits in River Storage Reservoirs for Oklahoma City Water Supply. Explains the inadequacy of the present supply, the recommended supply, and gives a study of the problems due to the deposition of silt in the storage reservoirs. 5000 w. Engng & Con—March 12, 1913. No. 40452.

Siphons

Colorado River Siphon. George Schobinger, Jr. Explains conditions and gives detailed description of the construction of the siphon near Yuma, Arizona. Maps & Ills. 10000 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41313 F.

Narrows Siphon of the Catskill Aqueduct. Alfred D. Flinn. Illustrated description of the cast-iron, flexible joint, submarine pipe line, 36 inches in diameter and 10,000 feet long, planned to carry water to Staten Island, N. Y. 2200 w. Eng Rec—Sept. 20, 1913. No. 45267.

Snow Conservation

Conservation of Snow for Irrigation; Its Dependence on Mountains and Forests. J. E. Church, Jr., in Bul. of Int. Irrigation Cong. Discusses the problem of conservation of snow and gives useful data of water content of snow areas of different character. 3500 w. Engng & Con—Feb. 5, 1913. No. 39698.

Consult Classification of the Index. See page 9.

Snow Surveys**Snow Surveys**

Snow Surveys for Predicting Stream Flows. J. Cecil Alter. Describes the instruments and surveys, and explains the practical use to which the data may be applied. Ills. 2500 w. Eng. News—May 29, 1913. No. 42561.

Softening.

The Kennicott Water-Softening Plant. Illustrated description of a recent plant embodying modern improvements. 1500 w. Engng—Feb. 7, 1913. No. 39917 A.

The Use of Permutit in Water Softening. Abstract of a paper by J. F. Garrett, read before the Illinois Water Supply Assn. Its characteristics and possible uses in the industries are discussed. 1500 w. Engng & Con—March 26, 1913. No. 40844.

The Use of Permutit in Water Softening. J. F. Garrett. Explains the most important characteristics of this compound. 1200 w. Technograph—Feb., 1913. No. 41712 C.

Municipal Water Softening. George A. Johnson. From a paper published by the U. S. Geol. Survey on "The Purification of Public Water Supplies." Discusses important features of the subject of water softening for domestic purposes. 4000 w. Can Engr—Aug. 14, 1913. No. 44398.

Specifications

Standard Specifications for Water-Works Hydrants and Valves. Gives specifications adopted by the Am. W.-Wks. Assn. 2500 w. Eng News—Aug. 7, 1913. No. 44253.

Spillways

Spillways of the Siphonic Type. A. G. Hillberg. Illustrates and describes a method permitting an automatic regulation of storage reservoirs and forebays. Gives data regarding tests in Switzerland. 2000 w. Eng Rec—May 3, 1913. No. 41844.

Stand Pipes.

The Design of a 300,000-Gal. Reinforced Concrete Standpipe for Penetanguishene, Ontario. Drawings and description. 800 w. Engng & Con—Jan. 22, 1913. No. 39331.

Reinforced Concrete Stand Pipe at Belton, Texas. Thomas L. Fountain. Illustrated description of the design and construction. 2000 w. Cornell Civ Engr—March, 1913. No. 40874 C.

The Recent Standpipe Failure at Cairo, Ill. G. C. Habermeyer. Illustrated description of the failure on Feb. 11, 1913, and report of damage, with discussion of the cause. 2500 w. Eng News—April 24, 1913. No. 41619.

Surge Tank at San Francisco

WATER SUPPLY**Sterilization**

Power Station No. 1. Illustrates and describes a large concrete standpipe built in connection with the first of a series of power developments on the Los Angeles aqueduct. 1500 w. Eng Rec—Sept. 13, 1913. Serial, 1st part. No. 45110.

Reinforced Concrete Stand Pipe at Belton, Texas. Thomas L. Fountain. Illustrated description of the design and construction. 2500 w. Cement & Eng News—Sept., 1913. No. 45136.

Sterilization

The Emergency Use of Hypochlorite Water Disinfection at Philadelphia. Francis D. West. Describes the precautions taken to prevent a typhoid epidemic when a break made it necessary to use river water. 1200 w. Eng News—Feb. 6, 1913. No. 39709.

The Sterilization of Potable Water with Chlorine. An account of measures adopted in Toronto, Canada, showing what can be done for the purification of water by chlorine and the difficulties. 2800 w. Engng—Feb. 7, 1913. No. 39918 A.

The Sterilization of Water by Ultra-Violet Rays (Stérilisation de l'eau par les rayons ultraviolets). M. de Recklinghausen. Description of the apparatus used; its invention, and results obtained in various services, especially the Marseilles experiments. Ills. 9100 w. Bul Soc Int d Elect—March, 1913. No. 41511 F.

Water Sterilization by Ultra-Violet Rays. Dr. Max von Recklinghausen. Brief explanation of the main principles embodied, the types of apparatus used, describing recent developments. Ills. 1500 w. Elec Wld—July 26, 1913. No. 43927.

Purifying Water by the Action of Ultra-Violet Light. Dr. M. von Recklinghausen. Explains the principles which form the basis of water sterilization by mercury quartz lamps. 1200 w. Sci Am—July 19, 1913. No. 43777.

The Use of Liquid Chlorine in Water Sterilization. Information from a recent paper by John A. Kienle, and from the Electro Bleaching Gas Co. 2000 w. Engng & Con—July 30, 1913. No. 44051.

Sterilizing Water with Ultra-Violet Rays. M. von Recklinghausen. Description of a new "Pistol" light and its applications in large and small plants. Ills. 1500 w. Eng Rec—Aug. 2, 1913. No. 44674.

Lime Sterilization of Water. Charles P. Hoover and Russell D. Scott. Gives results of research work conducted at the Columbus water-purification plant. 4000

Stream Flow

w. Eng Rec—Sept. 6, 1913. No. 44993.
See also Purification, under *Water Supply*.

Stream Flow

A Theoretical Formula for the Flow of Liquids Through Narrow Rectangular Channels. Ernst Jonson. Gives the formula developed, and the confirming experiments. 1200 w. Eng News—Dec. 19, 1912. No. 38330.

The Interpretation of Stream Flow Gaging Records of the Sunol and Niles Dams by an Experimental Study of the Flow Over Models. Describes the arrangements made for testing flowage and the experiments. 2500 w. Engng & Con—Jan. 8, 1913. No. 38937.

Kutter's Coefficient of Roughness in Chézy's Formula (Die Kutter'schen Rauheitsziffern in der Chézy'schen Formel). Th. Rümelin. Mathematical discussion, showing results of this combination. Diagram. 3000 w. Schweiz Bau—Dec. 21, 1912. No. 39012 D.

Measuring the Flow of a Stream. Richard Hamilton Byrd. Illustrated explanation of how water powers are accurately calculated. 1500 w. Sci Am—March 22, 1913. No. 40747.

Water Measuring Devices. W. G. Steward. Illustrates and describes current meters, canal gauges, wire gauges, automatic registers, etc., giving discharge tables and other information. 2500 w. Jour of Idaho Soc of Engrs—June 1912. No. 41726 N.

Methods of Estimating Stream Flow When Streams Are Frozen. W. G. Hoyt. Notes on methods employed in making computations of flow of water in ice-covered streams. 1600 w. Eng News—April 10, 1913. No. 41164.

Stream Flow Gagings Under Anchor Ice Conditions. Chester Wason Smith. Describes measurements made in winter showing the effect of temperature and anchor ice. 1500 w. Eng News—June 19, 1913. No. 42984.

Recent Gauging Methods in the Determination of Stream Flow Based on Research by the Swiss Hydrographical Bureau (Neuere Messmethoden zur Bestimmung von Wassermengen auf Grund von Versuchen der Schweizerische Landes hydrographie). W. Zuppinger. Description of a new chemical method recently applied. Ills. Serial, 1st part. 2500 w. Schweiz Bau—July 26, 1913. No. 44642 D.

Measurement of the Flow of Streams by Approved Forms of Weirs, with New Formulas and Diagrams. Richard R. Lyman. Details and summaries of the results of experiments by Francis, Bazin,

WATER SUPPLY

Fteley and Stearns, and at the hydraulic laboratories of Cornell University and the University of Utah. 83 pp. Pro Am Soc of Civ Engrs—Sept., 1913. No. 45521 F.

See also Meters and Reservoirs, under *Water Supply*.

Stream Gauging

Note on James Thomson's V-Notches. H. S. Rowell. Gives results of experimental investigations. Ills. 700 w. Engng—May 2, 1913. No. 42003 A.

Stream Regulation

The Emscher Federation and Its Work (Die Emschergenossenschaften und ihre Arbeiten). Herr Engberding. The organization of the association; its work in the regulation of the Emscher river, canalization, etc; the purification of water supplies, and the Imhoff tanks for the prevention of water pollution. Ills. Serial, 1st part. 3100 w. Glückauf—June 21, 1913. No. 43510 D.

Supply Problems

Water-Supply Problems in the West. R. O. Wynne-Roberts. Read before the Regina Engng. Soc. Explains geological conditions in the middle west, rainfall and evaporation, sterilization, filtration and distribution. 5000 w. Con Rec—May 21, 1913. No. 42345.

Supply Systems.

The Danger of Physical Cross Connections Between Public and Private Water Supply Systems—A Suggested Mechanical Safeguard. H. E. Jordan, in a paper before the Indiana San. & Water Supply Assn. A statement of the problem and a suggested solution. 1800 w. Engng & Con—March 5, 1913. No. 40347.

Permanent Water Supply for Cherryvale, Kan. Water is brought 6 miles and filtered for a town of 6,000 inhabitants. Ills. 2500 w. Eng Rec—Sept. 6, 1913. No. 42994.

Tanks

Elevated Tanks for Fire-Protective Service. Bryan Blackburn. Considers factors affecting the design, life and service of elevated tanks. 2500 w. Engineering Magazine—Dec., 1912. No. 37794 B.

The Design and Construction of a 600,000-Gal. Reinforced Concrete Elevated Water Tank at Berlin, Ontario. Illustrated description of a tank supported on a cylindrical shell, and its construction. 2000 w. Engng & Con—Dec. 25, 1912. No. 38550.

Large Reinforced Concrete Water Tanks. L. J. Mensch. Discusses their advantages, design, construction, &c. Ills. 2000 w. Ry & Engng Rev—Jan. 11, 1913. No. 39112.

Tanks

Typhoid

A Reinforced-Concrete Double-Deck Water Tank. Describes a tank of unusual design built recently at Rockford, Ill. 1200 w. Eng News—July 24, 1913. No. 43880.

See also Steel Towers, under *Construction*.

Typhoid

The Effect of Safe Water Supplies on the Typhoid Fever Rate. Dr. Allan J. McLoughlin. Abstract of an address delivered at meeting of the Assn. of Life Ins. Presidents. Discusses causes of typhoid epidemics from sewage polluted water. 2500 w. Can Engr—Dec. 12, 1912. No. 38271.

The Typhoid Outbreak at Albany, N. Y., Due to Flooded Filters. Theodore Horton. An account of this epidemic in April, 1913, showing the relation between the infection of the supply and the outbreak of the cases. 3000 w. Eng News—May 15, 1913. No. 42095.

Municipal Control of Typhoid Fever. Charles R. Grandy and C. J. Andrews. Suggestions for controlling the disease. 1500 w. Am Jour of Pub Health—Aug., 1913. No. 45534 C.

A Plea for a More Widespread Interest in the Investigation and Control of Typhoid Fever. Part I. Dr. William C. Hanson. Part II. Dr. Lyman A. Jones. 2000 w. Am Jour of Pub Health—Aug., 1913. No. 45532 C.

Institutional Vaccination Against Typhoid. John N. Force. Describes the preparation and administration of sensitized anti-typhoid vaccine. 1000 w. Am Jour of Pub Health—Aug., 1913. No. 45535 C.

Some Relations Between Filtered Water and Typhoid Fever, as Shown in the Two Years' Service of the Wilmington Filters. T. Chalkley Hatton. Brief description of the two years' work of the slow sand filters. 1800 w. Am Jour of Pub Health—Aug., 1913. No. 45533 C.

The Yakima Sanitary Campaign. Thomas Tetreau. A review of the year's work against typhoid fever in the Yakima Valley and the results achieved. 2500 w. Am Jour of Pub Health—Aug., 1913. No. 45531 C.

Typhoid Tests

Approved Technique of the Rideal-Walker Test. Samuel Rideal and J. T. Ainslie Walker. Specific directions for obtaining correct and satisfactory results in testing for typhoid bacillus. Ills. 3000 w. Am Jour Pub Health—June, 1913. No. 44005 C.

Valuation

The Valuation of Water-Works Undertakings on Transfer to Municipal Author-

WATER SUPPLY**Water Consumption**

ities. E. J. Silcock. Read before the Inst. of Water Engrs. Discusses the principles on which compensation should be determined. Discussion. 5500 w. Surveyor—June 13, 1913. No. 43137 A.

Vancouver

The City of Vancouver's Water Supply. Considers future extensions necessary, the available supply, size of pipe, cost data, etc. Ills. 2200 w. Can Rec—May 21, 1913. No. 42346.

Waste

Methods and Cost of Making House to House Inspection to Detect Water Waste in Chicago During 1911—Permanency of Plumbing Repairs. Abstracted from report of T. C. Phillips. 3000 w. Engng & Con—Jan. 8, 1913. No. 38936.

The Cause and Detection of Water Waste. From the *Real Estate Mag.* Discussing especially the conditions in New York and the great expense due to waste; the causes, difficulties, &c. 3000 w. Dom Engng—Feb. 8, 1913. No. 39761.

City Water Waste. Information from a report concerning the city of Ottawa, Can., with recommendations. 2500 w. Can Engr—March 13, 1913. No. 40681.

Water Waste Prevention. Abstract of a paper before the Am. W.-Wks. Assn. by I. M. de Varona. An account of work done in Manhattan and the Bronx Boroughs, New York, to avert water famine. The methods and results. 5000 w. Munic Jour—July 3, 1913. No. 43438.

Water-Waste and Pitometer Surveys in Philadelphia. John S. Ely. An account of house-to-house inspection to prevent waste, and pitometer surveys, with results obtained. 1800 w. Eng News—Oct. 2, 1913. No. 45655.

Present Status of the Question of Purification of Municipal Waste Waters (De tegenwoordige stand van het vraagstuk der zuivering van stedelijk afvalwater). A. H. op ten Noort. A review of the work accomplished in some English and German municipalities. Ills. 15600 w. De Ingenieur—Sept. 6, 1913. No. 46096 D.

Water Analyses

Reasons for Reporting Water Analyses in Ionic Form in Parts per Million. R. B. Dole. A plea for the general use of the ionic form. 4000 w. Eng Rec—June 21, 1913. No. 43112.

Water Consumption

Report of Committee on Water Consumption Statistics and Records. Report on desirable revision of forms, and discussion of reasons for the wide variation in daily consumption per capita in American cities. 115 pp. Jour N Eng W.-Wks Assns—March, 1913. No. 43160 F.

Water Departments**WATER SUPPLY****Water Tower****Water Departments**

Organization of the Department of Water, San Diego, California. H. A. Whitney. Describes the organization and duties of employees. 3000 w. Engng & Con—May 7, 1913. No. 41909.

Water Laws

State and National Water Laws, with Detailed Statement of the Oregon System of Water Titles. Discussion of John H. Lewis' paper. 13800 w. Pro Am Soc' of Civ Engrs—Nov., 1912. No. 38290 F.

State and National Water Laws, with Detailed Statement of the Oregon System of Water Titles. Continued discussion of John H. Lewis' paper. 19000 w. Pro Am Soc' of Civ Engrs—March, 1913. No. 41314 F.

Water Power

Certain Legal Aspects of Water-Power Development in Maine. Cyrus C. Babb. Gives extracts from a number of decisions intended to represent general principles, and discusses proposed legislation. General discussion. 26500 w. Jour N Eng W-Wks Assn—Sept., 1912. No. 37912 F.

Projects for Utilising and Transporting the Hydraulic Power of the Upper Rhone (Projet d'utilisation et de transport des forces hydrauliques du Haut Rhone Français). Henri Ourson. Proposed plans. Plate. 4500 w. Mem Soc Ing Civ de France—Sept., 1912. No. 37487 G.

The Federal Water-Power Policy. M. O. Leighton. Discusses federal regulation, its basis, need, etc., with a summary of important features of regulations approved Aug. 24, 1912. 4500 w. Eng News—Dec. 12, 1912. No. 38177.

Water Power Plant for the Wolfsheck Wood and Paper Manufactory (Wasserkraftanlage mit Holzstoff- und Papierfabrik Wolfsheck). Fr. Oesterlein. Describes the power plant of E. Holtzmann & Co. at Baden; intake canals, pressure pipes, and turbines. Ills. Serial. 1st part. 4500 w. Zeitschr des Ver deutscher Ing—Nov. 2, 1912. No. 38445 D.

The Plant of the Vigeland Company (Die Werke der Aktieselskabet Vigeland's Brug). Showing water power developments at this Norwegian aluminum factory. Ills. Serial. 1st part. 1000 w. Zeit f d Ges Turbinenwesen—Nov. 10, 1912. No. 38459 D.

Determining Power Possibilities on a Watershed. Lyle A. Whitsit. An analysis of the power possibilities on a large watershed, discussing the method of power determination. 4500 w. Eng News—Sept. 11, 1913. No. 45070.

See also Hydroelectric and Water Wheels, under ELECTRICAL ENGINEERING, *Generating Stations*, and Appraisals, under INDUSTRIAL ECONOMY.

Water Ram

An Experience with Water Ram. Charles W. Sherman. An explanation of a case where a hydraulic elevator in a summer hotel caused the trouble. Discussion. 3000 w. Jour N Eng W-Wks Assn—June, 1913. No. 43986 F.

Water Ram in Distribution System, Hartford, Conn. Caleb Mills Saville. An account of trouble due to the standpipes for filling locomotives, and other sources of water ram. Discussion. 2000 w. Jour N Eng W-Wks Assn—June, 1913. No. 43987 F.

Water Rates

Charges for Public Water Service to Private Fire Protection Systems. W. E. Miller. A summary of the arguments for and against the establishment of schedule charges for service of this kind, with particular reference to conditions at Milwaukee. 4000 w. Am W-Wks Assn—June, 1913. No. 44477 N.

Water Resources

Wise Utilization of Water Resources of Pennsylvania. Morris Knowles. Shows the blessings possible through wise conservation, the legislation required, the cost of floods, &c. Discussion by John C. Trautwine, Jr. Ills. 10000 w. Pro Engrs' Club of Phila—July, 1913. No. 44333 D.

Watersheds

The Reforestation and General Care of Watersheds. Ermon M. Peck. Deals particularly with the reforestation of the Hartford, Conn., watershed, and the care. 1500 w. Am W-Wks Assn—June, 1913. No. 44475 N.

The Yield of a Kentucky Watershed. George L. Thon and L. R. Howson. Attempts to analyze the various steps in the computation of yield on a particular watershed the run-off records of which were available for 26 years. 4000 w. Jour W Soc of Engrs—Sept., 1913. No. 46288 D.

See also Irrigation, and Reforestation, under *Water Supply*.

Water Towers

Large Reinforced Concrete Water Tower. A. W. Connor. Illustrates and describes features of design and construction of the tower at Berlin, Ont. 1500 w. Con Rec—April 30, 1913. No. 42078.

The Water Tower at the Nürnberg Switch Yards (Der Wasserturm im Rangierbahnhof Nürnberg). Hermann Gobel. Detailed description of this reinforced concrete tower. Ills. and plate.

Water Works.

2000 w. Beton u Eisen—Dec. 14, 1912. No. 39016 E.

See also Steel Towers, under *Construction*.

Water Works

Central Water-Works System of the Tennessee Coal, Iron & Railroad Company. Morris Knowles. Illustrated description of a system developed to provide for present and future needs of the company. 5500 w. Eng Rec—Nov. 23, 1912. Serial. 1st part. No. 37755.

Reasonable Requirements Imposed Upon Water Works Systems by the Fire Protection Problem. Review of Modern Practice. Clarence Goldsmith. From a paper before the New England W-Wks. Assn. A discussion of modern water department methods with special reference to fire protection problems. 7500 w. Engng & Con—Jan. 22, 1913. No. 39330.

Cost of Building Waterworks Plant and Power House. John W. Ash. Illustrated description of works at Dalton, Ga., including coagulating basin, filters, clear-water well, and reservoir. 2000 w. Eng Rec—Jan. 25, 1913. No. 39370.

To Improve St. Louis Water Works. Harry M. Crutcher. Illustrated description of the present plant and proposed extension. 3000 w. Munic Jour—Jan. 2, 1913. No. 38784.

The Design of the New Water Works Intake and Screen Tower at Louisville, Ky. G. D. Grain, Jr. Illustrated description of work nearing completion. 1500 w. Engng & Con—Jan. 29, 1913. No. 39586.

The Special Features of the Recent Water Works Improvements at Rushville, Ill. Information from a paper by F. H. Coult, read before the Ill. Water Sup. Assn. Describes a new pumping plant, and a large shallow well, pipe line and booster pumping-plant. 2200 w. Engng & Con—March 19, 1913. No. 40731.

A Small Water Works Plant for Kingsburg, Calif. C. F. Braun. Describes a plant for a town of about 1,000. 1200 w. Eng News—March 27, 1913. No. 40938.

Progress in Concrete Work as Related to Water Works Construction. William Curtis Mabee. Brief review of the growth of the cement industry in the United States and its application in water-works construction. 3000 w. Indiana Engng Soc—1912. No. 41742 N.

Design of the Reconstructed Water Works Plant in Miles City, Mont. G. C. Pruett. Illustrated general description of the plant and its equipment. 4000 w. Engng & Con—April 23, 1913. No. 41589.

Moose Jaw Water-Supply System. Il-

WATER SUPPLY

lustrated description of the work of bringing 1,000,000 gallons of water 19 miles to a Saskatchewan town and constructing head and distribution works in eight months. 3000 w. Eng Rec—June 21, 1913. No. 43111.

The Lowell Water Works and Some Recent Improvements. Robert J. Thomas. An illustrated account of improvements in the water works of Lowell, Mass., including an extension of the driven well system, a new pumping station and distributing reservoir. Discussion. 8000 w. Jour N Eng W-Wks Assn—March, 1913. No. 43159 F.

Water Works of Niagara Falls. Brief illustrated description. 25000 w. Munic Jour—June 12, 1913. No. 42838.

Water Works of San Diego. Reviews briefly the history of the water supply, illustrating and describing the present plant. 2500 w. Munic Jour—June 12, 1913. No. 42840.

Water Works. From a paper by George A. Johnson, read before the Am. W. Wks. Assn. A discussion of the essential and non-essential determinations in the general run of water analyses. 7500 w. Engng & Con—July 9, 1913. No. 43610.

Marshalltown's Municipal Water Works. Harry J. Rodgers. Brief illustrated account of a supply in Iowa from gravel by 30-foot wells. 1500 w. Munic Jour—Aug. 21, 1913. No. 44535.

Improved Management of Waterworks. Paul Hansen. Advocates the employment of consulting experts in connection with the operation of small waterworks installations, for improving the service, the equipment, and the economy of operation. Also discussion. 6000 w. Jour W Soc of Engrs—Sept. 1913. No. 46287 D.

See also Public Utilities, under **INDUSTRIAL ECONOMY**.

Water-Works Accounting.

A Discussion of Water Works Accounting with a Suggested System of Accounts. G. S. Olive. Paper before the Indiana San. & Water Supply Assn. Discusses the general scope of water works accounting and suggests a system. 2500 w. Engng & Con—March 5, 1913. No. 40350.

Weirs

Automatic Weirs (Automatisches Ueberfallwehr). K. Böhm. Describes the mechanism of the automatic weir, and discusses the theory of its action. Ills. 1800 w. Zeit d Oest Ing u Arch Ver—Sept. 27, 1912. No. 37434 D.

Experiments on Weir Discharge. W. G. Steward and J. S. Longwell. Discusses experiments made by the writers at the experiment station of the Boise

Weirs**WATERWAYS AND HARBORS****Canals**

Project of the U. S. Reclamation Service during 1911. 7500 w. *Pro Am Soc of Civ Engrs*—Feb., 1913. No. 40168 F.

Experiments on Weir Discharge. Continued discussion of the paper by W. G. Steward and J. S. Longwell. 2000 w. *Pro Am Soc of Civ Engrs*—Aug., 1913. No. 44793 F.

Experiments on Weir Discharge. C. H. Pierce's discussion of the paper by W. G. Steward and J. S. Longwell, Jr. Ills. 1500 w. *Pro Am Soc of Civ Engrs*—April, 1913. No. 41650 F.

Lessons from the Failure of a Weir and Sluices on Porous Foundations. W. G. Bligh. Illustrates and describes details of the design, the collapse of a portion of the work, and the lessons to be drawn. 3800 w. *Eng News*—Feb. 6, 1913. No. 39710.

The V-Notch Weir Method of Measurement. Discussion of D. Robert Yarnall's paper. 1000 w. *Jour Am Soc of Mech Engrs*—April, 1913. No. 41297 D. Experiments on Weir Discharge. Continued discussion of the paper by W. G. Steward and J. S. Longwell. 2000 w. *Pro Am Soc of Civ Engrs*—Aug., 1913. No. 44793 F.

Report on Weir in the Niagara River. An investigation as to the advisability of a dam at the outlet of Lake Erie, or of "compensating" works without complete regulation. Ills. 2500 w. *Eng Rec*—Aug. 23, 1913. No. 44547.

See also Stream Flow, under *Water Supply*.

Wells

Deep Artesian Well and Deferrating Plant. Illustrated description of an interesting artesian bore at Ottershaw,

Eng., and the purifying plant. 2500 w. *Engr, Lond*—Jan. 3, 1913. No. 39171 A.

Practical Well Sinking. B. A. Harrison. Briefly considers ancient wells, boreholes, origin of springs, and chemistry of well waters. Ills. 1200 w. *Prac Engr*—Jan. 30, 1913. Serial, 1st part. No. 39781 A.

The Experience of the State of Illinois With the Shallow Well. Dr. Edward Bartow. Read before the Indiana San. and Water Supply Assn. Describes the general experience, giving statistics. 1500 w. *Engng & Con*—March 12, 1913. No. 40451.

Yield of Limestone and Sandstone Wells. Information from a paper by Myron E. Fuller, read before the N Eng W-Wks Assn. Ills. 2500 w. *Munic Engng*—July, 1913. No. 44038 C.

See also Ground Water, under *Water Supply*.

Winnipeg

A Water Supply for Winnipeg. A report by an official board of consulting engineers, concerning Shoal Lake as a source of supply. 3000 w. *Can Engr*—Sept. 11, 1913. No. 45125.

Wood Pipe

The Manufacture of Wood Pipe. E. F. Week. Information concerning its use, limitations, manufacture, length of life, etc. 1500 w. *Wis Engr*—Feb., 1913. No. 41266 C.

Woolworth Building

Water-Supply System in the Fifty-five Story Woolworth Building, New York. Describes the pump, filter and tank service, and distribution and pressure control supplies for mechanical and switch purposes and fire protection. 3000 w. *Eng Rec*—July 12, 1913. No. 43659.

WATERWAYS AND HARBORS**Barge Canal**

New York State Barge Canal. Noble E. Whitford. A report of the progress made and features of construction. Ills. 2000 w. *Sci Am*—April 26, 1913. No. 41594.

Bank Strengthening on the New York Barge Canal. Describes the use of steel sheet-piling. Ills. 1500 w. *Eng News*—June 19, 1913. No. 42986.

See also Locks, under *Waterways and Harbors*.

Breakwaters

Concrete Superstructure Over the Detached Breakwater, Michigan City Harbor. G. A. M. Liljencrantz. Explains the exposed position and the concrete work to increase the stability. Ills. 1500 w. *Engng & Con*—April 9, 1913. No. 41194.

Brest

Study on the Creation of a Transatlantic Port at Brest (Étude sur la création d'un port transatlantique à Brest). A. Lavezzari. The advantages of the location and the constructional problem. Ills. 10,000 w. *Mem Soc Ing Civ de France*—April, 1913. No. 43080 G.

Canal Lining

Concrete Lining of the Main Canal on the Boise Irrigation Project. F. W. Hanna. Illustrated description of extension work in the west. 3000 w. *Eng Rec*—Dec. 21, 1912. No. 38320.

Canals

Navigable Waterways in Austria (Schiffbare Wasserstrassen in Oesterreich). Artur Oelwein. Arguments in favor of canals, giving comparative traf-

Consult Classification of the Index. See page 9.

Canals

WATERWAYS AND HARBORS

Channels

fic over railways and waterways. 3500 w. Zeit d Oest Ing u Arch Ver—Oct. 11, 1912. No. 37438 D.

Connecting Lake Washington, Seattle, with Puget Sound William L. Kidston. Illustrates and describes details of a ship canal to connect tidal waters with a fresh water lake. Map. 1800 w. Eng Rec—Dec. 7, 1912. No. 38079.

Proposed Rhine-North Sea Ship Canal. Information concerning two schemes under discussion for constructing a ship canal from the Rhine to the North Sea through Teutonic territory. 1100 w. Engr, Lond—Dec. 13, 1912. No. 38528 A.

Canalization Work in the City of Szczawa (Die Kanalisation der Stadt Szczawa). G. Thiem. An analysis of the plans presented. Map. Serial. 1st part. 3000 w. Zeit d Oest Ing u Arch Ver—Nov. 1, 1912. No. 38457 D.

Construction of the Calumet-Sag Canal. E. J. Kelly. Map. plans and description of the construction of the Calumet channel. Ills. 3000 w. Eng News—Jan. 23, 1913. No. 39372.

Proposed South Saskatchewan River Diversion Canal. Map and description of the scheme from a report by F. M. Peters. 2500 w. Can Engr—March 20, 1913. No. 40783.

The Proposed Georgian Bay Ship Canal. Review of a recent report describing this project in detail. It is essentially a river and lake canalization scheme, taking advantage of natural channels. Ills. 2500 w. Engr, Lond—April 4, 1913. No. 41244 A.

The Georgian Bay—Ottawa—Montreal Waterway. J. A. Macdonald. Reviews the proposed course of the canal and the difficulties encountered, and discusses the project. Ills. 2000 w. Can Engr—April 17, 1913. No. 41338.

The Barge Canal from the Hudson to the Lakes (Il Barge Canal dall' Hudson al Laghi) E. Sanjust. A descriptive review of this work and its purposes. Ills. 1500 w. Ann della Soc Ing e d Arch Ital—May 1, 1913. No. 42501 E.

Intercoastal Canal. Warren B. Reed. Considers the portion of the canal between the Mississippi River and the Rio Grande, particularly within Louisiana. Jour Assn of Engng Soc—July, 1913. No. 43997 C.

The Cape Cod Canal. Describes the country through which the canal passes, and explains the great saving in lives and property expected, giving a synopsis of the progress of this project, and its present construction. Ills. 2500 w. Eng—Jan. 3, 1913. No. 39143 A.

Electric Service in Connection with the

Cape Cod Canal. Illustrated description of the application of electricity in the construction of this canal. 1200 w. Elec Wild—Aug. 23, 1913. No. 44562.

The Cape Cod Canal. Describes this canal now being built, explaining its importance. Ills. 1600 w. Sci Am—Sept. 6, 1913. No. 45018.

The Barge Canal Crossing of Oak Orchard Creek, Medina, N. Y. Noble E. Whitford. Explains conditions, giving proposed schemes for crossing, and describing the adopted design. Ills. 4000 w. Eng News—July 31, 1913. No. 44108.

Proposed Welland Ship Canal. Map and description of the general features of the plan adopted. 2200 w. Eng Rec—July 12, 1913. No. 43653.

The New Welland Ship Canal. The third and greatest waterway to join Lakes Erie and Ontario described. Also notes relating to old Welland canals. Ills. 4500 w. Can Engr—Aug. 21, 1913. No. 44567.

The New Welland Ship Canal. Map, sections and description of the new canal under construction, which will be capable of taking boats up to 800 ft. length. 3000 w. Eng News—Sept. 25, 1913. No. 45488.

Intra-coastal Canal System for the Atlantic Seaboard. Considers the movement to construct a system of interconnected canals from Boston, Mass., to Beaufort, N. C. Maps. 1800 w. Sci Am—Sept. 6, 1913. No. 45019.

A Forward Canal Policy. W. M. Acworth. Read before the British Assn. Discusses the subject with particular reference to Birmingham, Eng. Does not think the policy justified. 2200 w. Ry Gaz, Lond—Oct. 10, 1913. No. 45972 A.

The Large Ship Canal Between Berlin and Stettin (Der Grossschiffahrtsweg Berlin Stettin). Herr Mattern. Description of the former canal, and the new line, straighter, deeper and wider, with the work of construction. Ills. Serial, 1st part. 4400 w. Zeit des Ver deutscher Ing—Aug. 23, 1913. No. 46035 D.

The Effects from Ship Propellers on Canal Beds (Die Wirkungen der Schiffschraube auf die Kanalsole). O. Flamm. Results of thorough investigations with model ships and canals showing effects produced by propellers and rudders in destroying the beds. Ills. 2800 w. Schiffbau—Sept. 10, 1913. No. 46049 D.

See also Reinforced Concrete, under Bridges.

Channels.

Factors in Channel Design. Data from studies made on the Hudson River of the relation of depth of navigable waterways

China

and draft of vessels to speed and propelling power. 3500 w. Eng Rec—March 1, 1913. No. 40265.

A Channel and Beach Maintenance Problem. R. R. Raymond. Explains conditions and proposed improvements of Absecon Inlet, near Atlantic City, N. J. Map. 5000 w. Eng News—July 24, 1913. No. 43879.

St. Lawrence Ship Channel Improvements. Harry Chapin Plummer. Illustrates and describes the construction of a 35-foot channel between Montreal and Quebec. 1800 w. Sci Am—Sept. 6, 1913. No. 45017.

China

Chinese Famine and Proposed Flood Prevention. Charles Davis Jameson. Condensation of a preliminary report on "River, Lake and Land Conservancy in Portions of the Provinces of Anhui and Kiangau, North of the Yangtze River." Map & Ills. 4500 w. Eng News—Sept. 25, 1913. No. 45487.

Colorado River

Irrigation and River Control in the Colorado River Delta. H. T. Cory. An illustrated detailed account of the successful and unsuccessful work in this region in connection with irrigation and river control. 215 pp. Pro Am Soc of Civ Engrs—Nov., 1912. No. 38287 F.

Irrigation and River Control in the Colorado River Delta. Continued discussion of H. T. Cory's paper. Maps & Ills. 15000 w. Pro Am Soc of Civ Engrs—March, 1913. No. 41316 F.

See also Levees, under *Waterways and Harbors*.

Curacao

Improving a Harbor of Curacao. Harry Chapin Plummer. Illustrated outline of improvements at Willemstad, Curacao Island, in anticipation of the opening of the Panama Canal. 1200 w. Sci Am—May 24, 1913. No. 42314.

Dikes

Details of Concrete Dike and Revetment Construction on the Missouri River, with a Review of the Development of Dike Construction on This Stream. Summary of an article by Edward H. Schultz. Ills. 4500 w. Engng & Con—Nov. 20, 1912. No. 37704.

Dock Machinery

See same heading, under *MECHANICAL ENGINEERING, Transporting and Conveying*.

Docks

Lake Superior & Ishpeming Ore Loading Dock. J. F. Jackson. Illustrated description of a steel and concrete structure at Marquette, Mich. 1400 w. Ry Age Gaz—Nov. 8, 1912. No. 37328.

WATERWAYS AND HARBORS

Drainage

Handling Traffic at Immingham Dock. Plate and explanation of method of dealing with trains. 700 w. Ry Gaz, Lond—Jan. 3, 1913. No. 39143 A.

Calculations for the Stability and Displacement of Graving Docks. Leonard Godday. Explains methods of working, giving diagrams and calculations. 1500 w. Can Engr—April 10, 1913. No. 41204.

Dock Design and Construction in Fort William and Port Arthur. William C. Sample. Information concerning the admirable harbor facilities, and illustrated description of an elevator dock now under construction. 2500 w. Can Engr—May 1, 1913. No. 41875.

Construction of Two Graving Docks at the Laninon Yards (Construction de deux formes de radoub sur les terre-pleins de Laninon). M. M. Bezault and Thérénat. Description of the work connected with the military port at Brest. Ills. 82 pp. Ann d Ponts et Chaussées—March, 1913. No. 42182. E. + F.

Hanging Fenders for Docks. H. J. Brunnier. Describes fenders as formerly used, and also the hanging fenders, explaining the great saving effected. Ills. 1300 w. W Engng—June, 1913. No. 43188 C.

Canadian Pacific Coal Unloading Dock. Illustrated description of a new plant at Ft. William, Ont., having a large capacity, and differing from the usual designs. 1800 w. Ry Age Gaz—May 30, 1913. No. 42635.

Calculation of Docks and Bulkhead Walls. A discussion of forces and loads and designs of structures necessary to resist them. Ills. 4000 w. Eng Rec—Sept. 20, 1913. No. 45269.

Northern Pacific Ore Dock. Illustrated description of the new steel and concrete dock at Allouez Bay, Wis. 2000 w. Ir. Trd Rev—Oct. 23, 1913. No. 46153.

See also Docks, under *Waterways and Harbors*.

Drainage.

A Discussion of the Economies of Constructing Cut-Offs Instead of Enlarging Original Channel in River Improvements for Drainage and Flood Control. Extracts from a discussion by William R. Hoag before the Minn. Soc. of Engrs. States a case, showing how a cut-off may, under certain conditions, prove economical. 2500 w. Engng & Con—March 12, 1913. No. 40456.

Drainage of the Haarlem Lake in Holland. M. C. G. Elliott. Abstract of a paper read before the N. Carolina Drainage Assn. Map and description of the largest drainage project in Holland.

Dredging

3500 w. Eng Rec—May 17, 1913. No. 42222.

See also same heading under *Municipal*, and *Mosquito Extermination*, under *Miscellany*; and *Reclamation and Drainage*, under *Construction*.

Dredging

Dredging Operations of the Dominion of Canada. Emile Low. Gives tabulated data of dredging plants owned and operated by the Dept. of Public Works, Canada, for year ending March 31, 1911, with related information. 2500 w. Eng News—Nov. 7, 1912. No. 37321.

Methods and Cost of Dredging Gravel, Using a Weeks' Two-Line Shovel. W. C. Weeks. Illustrated description of work at Vancouver, B. C. 900 w. Engng & Con—Feb. 5, 1913. No. 39690.

Dredging Equipment for Harbor Maintenance. From a paper by C. O. Sherrill. Discusses types of dredges, their adaptability, etc. 1800 w. Eng Rec—March 8, 1913. No. 40371.

Cost of Dredging 21,016,512 Cu. Yds. of Material with 38 Hydraulic Pipe Line Dredges During 1912. Costs and description of the work of the pipe line operated from July 1, 1911, to July 1, 1912, as tabulated from the reports of the Chief of Engrs., U. S. Army. 5000 w. Engng & Con—April 23, 1913. No. 41588.

Hydraulic Dredging on New York Barge Canal. Emile Low. Illustrates and describes some of the more recent types of suction dredges, their performance, and approximate costs of operating them. 8800 w. Eng News—April 10, 1913. No. 41162.

Dredging. M. G. Kindlund. Describes methods in general use for loosening the materials to be dredged, explaining the characteristics of the different materials. Ills. 5000 w. Int Marine Engng—May, 1913. No. 41896 C.

Dredging Problems in Wilmington Harbor, Delaware. R. R. Raymond. Describes the physical condition of the harbor and plans proposed to reduce the rate of silt deposit, and the maintenance problems. 4500 w. Eng News—May 8, 1913. No. 41940.

Cost of Dredging 29,708,465 cu. yds. of Material With 24 Sea-going Hopper Dredges During 1912. Notes on the year's operations, with tabulated statistics. 3500 w. Engng & Con—April 30, 1913. No. 41820.

Dredging Work at the Entrance to the Western Channel of Surabaya (De slibarbeid op den drempel van het Westervaarwater van Sverabaja). A. J. M. A. Ridder. An account of this work in the Dutch Indies and the particular type of

WATERWAYS AND HARBORS**Flood Prevention**

dredge constructed for the work. Ills. 7000 w. De Ingenieur—May 10, 1913. No. 43050 D.

Hydraulic Dredging on the Upper Mississippi River. R. Monroe. Describes the work in progress, the dredges, dredging operations, etc. Ills. 3000 w. Eng News—July 24, 1913. No. 43877.

Equipment and Performance of the British Columbia Dredging Fleet. Gives operating cost of five different types of dredges and auxiliary plant, with a discussion of causes of delay. Ills. 3000 w. Eng Rec—Aug. 23, 1913. No. 44548.

Records and Cost of Work of Dipper Dredges Operated by the United States Engineers in River and Harbor Improvements. 4000 w. Engng & Con—Aug. 13, 1913. No. 44350.

Electric Power on a Dredger. Richard E. Smith. Illustrated account of work on the Pacific Coast, describing the largest machine in use. 1000 w. Elec Rev & W Elect'n—Oct. 18, 1913. No. 45959.

See also *Dredge Recorder*, and *Dredges*, under *MARINE AND NAVAL ENGINEERING*.

Flood Control

The Problem of Flood Control. C. McD. Townsend. Condensed from an address before the Nat. Drainage Cong. Considers the sources of floods, and methods of control by reforestation, reservoirs, and levees. 4000 w. Eng News—April 17, 1913. No. 41336.

Flood Control in the Sacramento Valley, California. Fred H. Tibbitts. Describes the topography, flood conditions, and flood control projects. Map & Ills. 9800 w. Engng & Con—April 9, 1913. No. 41195.

See also *Reservoirs*, under *Water Supply*.

Flood Prevention.

Knight's Landing Cut Project in the Sacramento Valley. An account of a proposed by-pass to divert part of the flow of the Sacramento River to prevent flooding of cultivated land. 3000 w. Eng Rec—March 15, 1913. No. 40645.

Control vs. Prevention. A symposium of opinions of eminent engineers regarding the most effective means of ending flood losses. 5000 w. Cassier's—July, 1913. No. 43350.

Flood Prevention Investigations in Ohio. Explains plans for controlling about 100 miles of the Miami River and other streams. 2500 w. Eng Rec—July 12, 1913. No. 43655.

Flood Prevention and Water Conservation Measures in Germany. A summary of the principal features of flood control reservoirs and of the laws governing them. Ills. 2500 w. Eng Rec—July 19, 1913. No. 43789.

Consult Classification of the Index. See page 9.

Flood Protection**WATERWAYS AND HARBORS****Floods**

Proposed Plan of Flood Prevention for Dayton, Ohio, and the Miami River Valley. Gives the report of the Flood Committee of the Dayton Citizens' Relief Commission. 2500 w. Engng & Con—Oct. 15, 1913. No. 45892.

Flood Protection for Dayton. Abstract of a preliminary report. Urges co-operation among communities. 2000 w. Eng Rec—Oct. 11, 1913. No. 45809.

See Mississippi River, under *Waterways and Harbors*.

Flood Protection

Flood Protection Work on the Kansas River at Kansas City, Kans. Edward H. Schultz. Explains the physical characteristics and describes the improvement. Map. 2500 w. Engng & Con—Dec. 4, 1912. No. 38050.

Flood Protection at Kansas City. Everett B. Murray. Illustrates and describes improvement works in the way of levees, bank revetment, and bridge alterations. 2500 w. Eng News—Dec. 26, 1912. No. 38591.

Flood Reservoirs

Relation of the Proposed Pittsburgh Flood Reservoir System to Navigation. Conclusions reported to Congress by a board of engineering officers appointed to determine whether reservoirs at the head waters of the Ohio River would be an aid to navigation. 3000 w. Eng Rec—May 10, 1913. No. 41956.

Floods

Flood Data in Canadian River Basin, New Mexico. W. B. Freeman and Glenn A. Gray. Considers the relation between rainfall and run-off. 2000 w. Eng Rec—Dec. 21, 1912. No. 38326.

A Review of the Floods of the Lower Mississippi With a Discussion of the Methods of Control by Levees. A. L. Dubuey. Read before the Illinois Soc. of Engrs. & Survs. A review of the evidence and reasoning in defense of levee control. Map. 6000 w. Engng & Con—Feb. 12, 1913. No. 39833.

The Flood of Jan. 9, 1913, at Pittsburgh, Penn. Kenneth C. Grant. Describes the conditions which caused the flood, and the damage. Ills. 3000 w. Eng News—Jan. 30, 1913. No. 39595.

A Birdseye View of Conditions in the Ohio Flood Districts. Reports from various places, with map and illustrations. 4000 w. Eng News—April 17, 1913. No. 41235.

The Wabash River Flood, March 21—April 2, 1913. R. L. Sackett. Gives rainfall data and an illustrated account of damage at Lafayette, Ind. 2500 w. Eng News—April 24, 1913. No. 41621.

The Recent Flood at Columbus, Ohio. Julian Griggs. Map and Description of conditions at Columbus, and illustrated account of the damage by the flood of March 23-27, 1913. Also editorial on need of river regulation, and a letter from Rudolph Hering. 7500 w. Eng News. April 10, 1913. No. 41167.

Results of Recent Flood at Columbus. J. J. Morgan. Maps and illustrated account of the damages to bridges and levees, and plans for improving river channels. 2000 w. Eng Rec—April 19, 1913. No. 41359.

Flood Devastation at Dayton, Ohio. An illustrated account of the inundation of nearly one-half the city by heavy rainfalls and cloudbursts. 2000 w. Eng Rec—April 12, 1913. No. 41185.

The Flood of March 25 at Akron, Ohio. Map and description of the location and report of the damage from the flood. Ills. 1300 w. Eng News—April 10, 1913. No. 41168.

Damage to Structures in the Indianapolis Flood. De Witt V. Moore. Illustrated account, with special reference to the damage to structures. 5000 w. Eng News—April 24, 1913. No. 41625.

The Flood at Indianapolis. De Witt V. Moore. Descriptive account of its progress, with illustrations. 2000 w. Eng News—April 17, 1913. No. 41337.

Effects of the Flood in Indiana. Charles Brossman. Gives records of rainfall, river stages and damage to engineering structures. Ills. & Plate. 3500 w. Eng Rec—April 5, 1913. No. 41116.

The Flood in the Middle West. An illustrated account of the effect on electric railways in Indiana, Ohio, Pennsylvania and New York. 13500 w. Elec Ry Jour—April 5, 1913. No. 41107.

The Flood of March-April, 1913, on the Ohio River and Its Tributaries. John C. Hoyt. Information concerning the precipitation and flood heights at various points, urging a complete system of river control. 2000 w. Eng News—April 10, 1913. No. 41169.

The Pittsburgh Flood of March 27. Morris Knowles. Gives records of precipitation and flood stages of rivers in various localities. Ills. 2000 w. Eng Rec—April 19, 1913. No. 41360.

Effects of Recent Floods on New York Streams. Robert E. Horton. A study of rainfall and stream discharge, with hydrographs for fourteen rivers. Ills. 3500 w. Eng Rec—April 12, 1913. No. 41184.

Floods and the Problems of River Regulation. Charles Whiting Baker. Discusses the cause of the recent floods, the effect of forests, the responsibility of

Floods

WATERWAYS AND HARBORS

Flood Sanitation

man, flood control, the reservoir system, levees, etc. Ills. 4500 w. Sci Am—May 3, 1913. No. 41782.

The Control of the Mississippi Floods. Ch. D. Townsend. Address delivered before the National Drainage Congress. Considers the sources of floods, and their control by reforestation, reservoirs and levees. Ills. 5000 w. Sci Am Sup—May 3, 1913. No. 41784.

The Business Man's Interest in Flood Protection, River Regulation and Drainage. Frank B. Knight. Read before the Nat. Drainage Cong. Shows the direct interests through the increase of raw material, increased market, the loss of life, etc. 4500 w. Jour Worcester Poly Inst—May, 1913. No. 42402 C.

The Cause of Floods and the Factors That Influence Their Intensity. Daniel W. Mead. Discusses the cause of floods and some of the reasons for the variation that occurs in the magnitude, results, etc. General discussion. Ills. 12500 w. Jour W Soc of Engrs—April, 1913. No. 42360 D.

Is Man Responsible for Floods? Editorial discussion of the effect of civilization on the run-off of streams. 1500 w. Eng News—May 1, 1913. No. 41867.

Notes from the Miami Valley. Illustrated notes on conditions at Piqua, Troy, Dayton, Miamisburg, Hamilton, etc. 5000 w. Eng News—May 1, 1913. No. 41870.

The Rainfall and Flood Conditions in Ohio, March 23 to 28, 1913. J. Warren Smith. Gives a special report prepared for the Weather Bureau. Ills. 1200 w. Sci Am Sup—May 10, 1913. No. 41915.

Investigation of Flood Flow on the Watershed of the Upper Wisconsin River—Merrill and Above. Clinton B. Stewart. A study of the character of the soil and topography, the maximum rainfall conditions, and the flow. Maps. 3000 w. Jour W Soc of Engrs—April, 1913. No. 42361 D.

The Cuyahoga River in the Flood of March 25-26, 1913. Edgar B. Thomas. Describes and illustrates the effects of the rainfall and high water in and near Cleveland, O. 1500 w. Eng News—May 1, 1913. No. 41869.

How an Industrial Plant Was Saved from the Flood. C. Mengel Struck. Brief illustrated description of how a lumber yard and planing mill was protected by an emergency flood wall. 1500 w. Eng Rec—May 24, 1913. No. 42376.

A Report on the Practicability of a Reservoir System for Controlling Flood Waters from the Upper Tributaries of the Ohio River. Gives the report by a

board of engineers which shows material differences in estimates of work from those published by the Pittsburgh Flood Commission. 3000 w. Engng & Con—June 18, 1913. No. 42940.

Flood Flows. Weston E. Fuller. A study of the frequency of floods, showing the relation between the catchment area and the magnitude of the flood, and presenting formulae and tables to aid in estimating the probable maximum flood to be expected. 12000 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42910 F.

Preventing the Floods. Henry Harrison Suplee. How the nation can save millions of dollars of useless waste by utilizing the Panama Canal equipment. Ills. 5000 w. Cassier's—June, 1913. No. 42862 B.

Flood Protection at the Illinois Mines. Brief illustrated description of methods employed in protecting the shafts of the O'Gara Coal Co. during the recent floods. 1200 w. Coal Age—May 31, 1913. No. 42623.

Floods and Levees at Cairo, Ill. Describes the flood protection works under way and in prospect. Ills. 3000 w. Eng News—July 17, 1913. No. 43836.

Bridge and Flood Destruction in California. Henry Gratton Tyrrell. Illustrations and notes pertaining to flood destruction in 1907. 2000 w. Ry Engng & Main of Way—Aug., 1913. No. 44359.

The Control of River Floods. C. McD. Townsend. Read at meeting of Drainage Cong., in St. Louis. Discusses the sources of floods, the influence of forests on stream flow, reservoirs, levees, &c. 4500 w. Can Engr—Aug. 14, 1913. No. 44395.

Proposed Plan for Flood Protection at Columbus, Ohio. Describes the preferred plan as given in a preliminary report made by John W. Alvord and Charles B. Burdick. 2500 w. Engng & Con—Sept. 24, 1913. No. 45457.

The Ohio Valley Flood of March-April, 1913. A. H. Horton and H. J. Jackson. Gives the history of this flood, including comparisons with some earlier floods. Ills. 92 pp. U S Geol Surv—Paper 334. No. 46105 N.

See also Reservoirs, under *Water Supply*, and Flood Damage, under *RAILWAY ENGINEERING, Permanent Way and Buildings*.

Flood Sanitation

Methods Employed at Zanesville and Columbus, Ohio, in Reestablishing Sanitary Conditions in Flooded Districts. Gives two examples of the application of the rules of the Ohio State Board of Health. 2500 w. Engng & Con—July 23, 1913. No. 43876.

Consult Classification of the Index. See page 9.

Gage Heights

WATERWAYS AND HARBORS.

Levees

Gage Heights

Establishing Ex-Post-Facto Gage Heights. C. F. Brown. Describes in detail methods employed to determine the daily discharge of the St. Joe River at St. Maries, Idaho. Ills. 2500 w. Eng News—May 29, 1913. No. 42563.

Great Lakes

The Livingstone Channel, the Latest Aid to Lake Traffic. R. D. Williams. Illustrated description of the excavation of a new route for downbound vessels from the Great Lakes. 2000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38739 D.

Harbor Machinery.

Developments in Mechanical Haulage in Harbors (Fortschritte und Bestrebungen auf dem Gebiete der Fördertechnik in Häfen). C. Michenfelder. A review of modern attainments in the unloading and loading of ships. Ills. Serial. 1st part. 5000 w. Zeit des Ver deutscher Ing—Feb. 8, 1913. No. 40535 D.

Harbors

Proposed Inner Harbor Plan for the City of Richmond on San Francisco Bay. Map, section and description of a proposed improvement. 4800 w. Engng & Con—Dec. 4, 1912. No. 38047.

The Harbor Equipment at Basle, and Shipping on the Upper Rhine (Die Rheinhafenanlagen in Basel und die Schifffahrt auf dem Oberrhein). Maps, illustrations and description of wharfage and mechanical equipment of this river port. 3300 w. Schweiz Bau—Nov. 9, 1912. No. 38434 D.

Harbor Works in the Tripolitaine. Illustrated description of the Italian harbor works at Bengasi. 700 w. Engr, Lond—May 16, 1913. Serial, 1st part. No. 42541 A.

Improvement Work in the Harbor of Harlingen (De werken tot verbetering van de haven te Harlingen). J. Lely. Description of the dike re-construction and revetment adopted. Ills. 3800 w. De Ingenieur—May 17, 1913. No. 43051 D.

Laying Out a Model Harbor. Henry C. Long. Describes plans being developed at St. Petersburg, Fla. 1500 w. Mfrs. Rec—July 17, 1913. No. 43767.

Electrical Equipment and Concrete Construction at Auckland Harbor. W. Wilson. Illustrates and describes the plant, building methods, and mechanical handling plant. 3520 w. Engineering Magazine—Nov., 1913. No. 46306 B.

Harbor Projections and Their Effect Upon the Travel of Sand and Shingle. Ernest R. Matthews. Read before the British Assn. Discusses the effect on the coast line of harbor projections, dealing

chiefly with sandy coasts. Ills. 1200 w. Engng—Sept. 19, 1913. Serial, 1st part. No. 45570 A.

Inland Navigation

From Coal Fields to the Gulf. Albert Phenix. Illustrated account of the locks and dams in the Warrior and Tombigbee rivers for the improvement of navigation. 4000 w. Mfrs' Rec—Aug. 28, 1913. No. 44794.

Inland Navigation in Germany from 1888 to 1913 (Die deutsche Binnenschifffahrt von 1888 bis 1913). Oskar Teubert. A review of improvements made in canals, locks and shipping in the past twenty-five years. Ills. Serial, 1st part. 5600 w. Schiffbau—July 9, 1913. No. 44630 D.

Navigation in Interior France and Other Countries (La Navigation intérieure en France et à l'étranger). A comparative study of the inland waterways of France, Holland, Canada, Germany, etc. Ills. 3000 w. Tech Mod—June 1, 1913. No. 43070 D.

Japan

Harbor Construction at Kobe and Yokohama, Japan. Wilson T. Howe. Notes based on a recent visit. Ills. 1000 w. Eng News—Sept. 8, 1913. No. 45224.

Jetties

Construction Methods Employed in Rebuilding the Jetties at Humboldt Bay, California, with Some Costs. Information from an article by Morton L. Tower in Prof. Mem. 4500 w. Engng & Con—Oct. 8, 1913. No. 45752.

Lake Erie

The Water Level of Lake Erie. Report of the International Waterways Commission on the value of compensating works in the Niagara River. 3000 w. Can Engr—Sept. 18, 1913. No. 45251.

Levees

Concrete Slabs in Levee Construction. E. B. Murray. Illustrated account of work in the Kaw Valley Drainage District, in Kansas. 1500 w. Concrete-Cement Age—Dec., 1912. No. 38156.

Concrete Dikes and Bank Protection on the Missouri River. Edward H. Schulz. Briefly describes the various steps of progress on methods of regulating the Missouri River, and gives illustrated description of the dike works, and the concrete revetment. 3000 w. Eng News—Dec. 26, 1912. No. 38592.

Levee Construction in the Colorado River Delta and the Rock Fill Dam Method of Closing Crevasses A summary of methods of river control, with maps, based on descriptions by H. T. Cory in a paper before the Am. Soc. of Civ. Engrs.

Lighthouses

3000 w. Engng & Con—Dec. 11, 1912. No. 38149.

A Suggested Method for Closing a Crevasse in a Levee. C. O. Sherrill. Explains past methods and describes a type of closure using steel sheet piling. 1300 w. Engng & Con—Jan. 29, 1913. No. 39579.

A Discussion of Levee Location, Height and Grade. Two useful tables and discussion of the proper location, height and grade of levees taken from a report of Arthur A. Stiles. 3000 w. Engng & Con—June 4, 1913. No. 42664.

Closure of Beulah Levee Crevasse. A. L. Dabney. Illustrated detailed description of emergency repair work in the lower Mississippi River Valley. 4000 w. Eng Rec—July 5, 1913. No. 43466.

Large Clam-Shell Dredges; Levee Building Methods and Standards in California. Fred H. Tibbetts. Illustrates and describes the dredges and methods used. 1200 w. Eng News—Sept. 4, 1913. No. 44986.

See Mississippi River, and Shore Protection, under *Waterways and Harbors*.

Lighthouses

See Panama Canal, under *Waterways and Harbors*.

Livingstone Channel

Testimony in Re the Livingstone Channel on the Reference of the Governments of the United States and the Dominion of Canada Under Article IX of the Treaty of May 5, 1910. Also report of April 8, 1913, on recommendations in reply to questions submitted. 243 pp. Int Joint Com, Ottawa—May, 1913. No. 42499 N.

Locks

Barge Canal Locks at Lockport, N. Y. Emile Low. Illustrated general description of the two-flight structure and its equipment. 3000 w. Eng Rec—June 14, 1913. No. 42827.

Electrical Equipment of Charles River Locks. Illustrated description of extensive electric motor applications at the lower end of Charles River Basin for operating boat locks connecting the basin with Boston Harbor. 5000 w. Elec Wld—June 21, 1913. No. 43104.

Lock and Dry-dock at Keokuk. Illustrated description of a new type of disappearing gate for one of the largest locks in the world, operated from a central station by compressed air. 3500 w. Eng Rec—July 26, 1913. No. 43931.

Reinforced Concrete Construction on the Canal Locks at Hohensaaten (Die Eisenbetonkonstruktionen der Seileppzugschleusen bei Hohensaaten). Herr Bergius. The construction of chamber and

WATERWAYS AND HARBORS**Panama Canal**

retaining walls, piles, etc., used in the locks. Ills. 3200 w. Beton u Eisen—July 1, 1913. No. 44637 E.

See Panama Canal, under *Waterways and Harbors*.

Madras

I. The Remodelling and Equipment of Madras Harbor. Sir Francis J. E. Spring. II. The Alteration of the Form of Madras Harbor. Hugh Henry Gordon Michell. Describes the construction of one of the most efficient harbors in the East. Two papers discussed together. Plates. 118 pp. Inst of Civ Engrs—Nos. 3964 & 4012. No. 42370 N.

Manchester, Eng.

The Inland Port of Manchester. Describes the physical features and facilities of the port and its development. Ills. 5000 w. Eng News—Dec. 12, 1912. No. 38175.

The Trafford Park Industrial District at Manchester, England. An illustrated account of an industrial enterprise related intimately with the prosperity of the ship canal and the city. 2000 w. Eng News—Dec. 12, 1912. No. 38174.

Mississippi River

Controlling the Mississippi River. Col. C. McD. Townsend. From a paper read at the Interstate Levee Congress. Presents in detail the reasons why the levee system of river regulation has been found superior. 4500 w. Eng News—Oct. 31, 1912. No. 37211.

Discussion of Papers "Flood Protection for Mississippi Valley." 4500 w. Jour Assn of Engng Soc—Nov., 1912. No. 37535 C.

Missouri River

Aids to Navigation on the Missouri River. Frank C. Perkins. Illustrates and describes the development of the regulation works and the concrete improvement of the river, and the use of concrete piles in dam construction. 2200 w. Sci Am Sup—Feb. 15, 1913. No. 39886.

Ore Docks

Reinforced Concrete Ore Docks. Illustrated article dealing with ore-loading docks in general, and particularly modern docks of reinforced concrete. 3500 w. Eng News—Jan. 2, 1913. No. 38778.

Steel Ore Dock: D. & I. R. R. R. Illustrated description of a large steel dock at Two Harbors, Minn. 1000 w. Eng News—Jan. 2, 1913. No. 38779.

Panama Canal

Annual Report of the Isthmian Canal Commission. Report of George W. Goethals for the year ending June 30, 1912. 68 pages. Isthmian Canal Commission—Nov., 1912. No. 37238 N.

Consult Classification of the Index. See page 9.

Panama Canal.

WATERWAYS AND HARBORS

Panama Canal

The Panama Canal. Photographs illustrating progress in construction, and abstracts from Col. Geo. W. Goethals's annual report. *Engineering Magazine*—Dec., 1912. No. 37792 B.

Extracts from the Annual Report of the Isthmian Canal Commission. From the report by George W. Goethals for the year ending June 30, 1912. Ills. 9500 w. *Eng News*—Nov. 21, 1912. No. 37726.

A Review of the Methods and Costs of Constructing the Panama Canal During the Past Fiscal Year. Abstract from report of Colonel Goethals. Ills. 7500 w. *Engng & Con*—Nov. 20, 1912. No. 37700.

Progress on the Panama Canal. Summary of the engineering features from the report of Col. George W. Goethals for the year ending June 30, 1912. Ills. 9800 w. *Eng Rec*—Nov. 23, 1912. No. 37758.

The Electrification of the Panama Canal. David B. Rushmore. Illustrated account of the extensive application of electricity for the operation of the canal. 2200 w. *Sci Am*—Nov. 9, 1912. No. 37339.

Culebra Cut and the Problem of the Slides. D. D. Gaillard. An illustrated explanation of the work and the trouble caused by slides. 4000 w. *Sci Am*—Nov. 9, 1912. No. 37336.

The Gatun Dam and Locks. William L. Sibert. Illustrated description of the construction. 3000 w. *Sci Am*—Nov. 9, 1912. No. 37335.

Gate Mechanisms of the Panama Canal Locks. Illustrated explanation of the mechanical principles employed and the great size and difficult foundry and machine shop products required. 4000 w. *Ir Age*—Nov. 21, 1912. No. 37722 C.

Marine Lighting Equipment of the Panama Canal. James Pattison. Illustrated description of the system of automatic unattended lights, using dissolved acetylene (Dalén patents). 4500 w. *Soc of Nav Archts & Marine Engrs*, No. 4—Nov. 21, 1912. No. 37687 N.

The Sanitation of the Canal Zone. Dr. A. J. Orenstein. An interesting account of the sanitary work which made possible the building of the canal. Ills. 2500 w. *Sci Am*—Nov. 9, 1912. No. 37337.

Panama Canal Tolls. Emory R. Johnson. Abstract of an official report. Discusses the operating and maintenance expenses, the military expense and other costs and how they should be met. The rates of toll, etc. 6000 w. *Ry Age Gaz*—Dec. 6, 1912. No. 38070.

The Panama Canal. Percy F. Martin. First of a series of articles giving an illustrated detailed description of the work, and much related information. 3000 w. *Engr, Lond*—Nov. 29, 1912. Serial. 1st part. No. 38132 A.

The Panama Canal. Deals particularly with the locks at the Pacific end of the canal. Ills. 3000 w. *Engng*—Dec. 6, 1912. No. 38246 A.

A Visit to the Panama Canal. E. D. Edmonston. Describes the canal as seen on this visit, explaining the main features. Ills. 7000 w. *Pro Am Inst of Elec Engrs*—Dec., 1912. No. 38514 F.

Hydrology of the Panama Canal. Caleb Mills Saville. A record of certain facts bearing on the hydrology and other natural phenomena of the Chagres River Basin, showing that the water supply of Gatun Lake is sufficient for any probable demands of navigation. Maps and Ills. 20000 w. *Pro Am Soc of Civ Engrs*—Jan., 1913. No. 39388 F.

Mining on the Panama Canal. C. R. Forbes. Notes on the method of working in the big cut at Culebra. Ills. 2000 w. *Min & Sci Pr*—Dec. 28, 1912. No. 28763.

Unit Costs of Construction on the Panama Canal for the Fiscal Year Ending June 30, 1912. Information from the report of Col. Goethals. 5000 w. *Engng & Con*—Jan. 1, 1913. No. 38767.

Some Statistics of Performance of Stone Crushers, Cableways, Cranes and Concrete Mixers at Panama. Information from a report by Mr. Ad. Faure, covering the year ending June 30, 1912. 2000 w. *Engng & Con*—Jan. 8, 1913. No. 38935.

The Engineering and Electrical Features of the Panama Canal. M. C. Turpin. Illustrates and describes features of interest. 3500 w. *So Elect'n*—Jan., 1913. No. 39214.

Panama Canal Lighting Plan. Walter F. Byer. Outlines the plan of illuminating this waterway and criticizes the paper by James Pattison, read before the Soc. of Nav. Archts. & Marine Engrs. 2000 w. *Marine Rev*—Jan., 1913. No. 39195 C.

Panama Traffic and Tolls. Emory R. Johnson. The unwisdom of toll exemption for coastwise ships. 4000 w. *Jour W Soc of Engrs*—Jan., 1913. No. 39955 D.

The Panama Canal in International Law. H. S. Knapp. A discussion of the present treaty obligations of the United States with respect to the canal. 10500 w. *Pro U S Nav Inst*—March, 1913. No. 40919 E.

Lock Gates for the Panama Canal. Illustrated description of the 630-ton steel gates, 82 feet high, and of the special

Panama Canal

WATERWAYS AND HARBORS

Piers

methods adopted for their fabrication. 4500 w. Eng Rec—March 1, 1913. No. 40259.

The Panama Canal. David A. Molitor. Reviews the history of the Isthmian canal, discusses briefly the five projects, and gives related information. Ills. 8000 w. Ap Sci—March, 1913. No. 41258 C.

The Panama Canal. Franklin D. Jones. Illustrates and describes interesting mechanical features. 5500 w. Mach, N Y—April, 1913. No. 40978 C.

The Slides in the Central Excavation of the Panama Canal (Les éboulements de la tranchée centrale du Canal de Panama). A. Dumas. A review of the conditions at Culebra, and the vast amount of work caused by the slides. Ills. 7000 w. Genie Civil—March 22, 1913. No. 41524 D.

The Panama Canal. The present number deals particularly with the locks and plants for their construction. Ills. and Plates. 6000 w. Engng—May 9, 1913. Serial. 1st part. No. 42287 A.

The Panama Canal. R. E. Bakenhus. Gives a résumé of the early history, describes the physical characteristics of the route, the choice of type, and a general description of the canal and its construction. Ills. maps and plans. 78 pp. Pro U. S. Nav Inst—June, 1913. No. 43174 E.

The Problem of Panama. James Nisbet Hazlehurst. Brief review of the work, especially the excavation of Culebra, describing the geology of that section. 5500 w. Mfrs' Rec—May 29, 1913. No. 42565.

Electrifying Panama Canal. Outlines the elaborate plans for electrical energy. Ills. 1800 w. Marine Rev—Aug., 1913. No. 44285 C.

The Chain Fenders for the Panama Canal. Illustrates and describes details of the hydraulically operated devices for bringing ships to rest and thus protecting the lock gates. 1500 w. Ir Age—Aug. 7, 1913. No. 44203 C.

The Panama Canal as It Relates to the Treaties. C. M. Chester. Information concerning the treaties and their intentions, and discussion of the exemption of U. S. coasting trade from tolls, the Monroe Doctrine, &c. 3300 w. Pro Engrs' Club of Phila—July, 1913. No. 44337 D.

The Navy and the Panama Canal. Harry S. Knapp. The writer's views of how the canal will affect the strength of the navy. 7500 w. Pro U S Nav Inst—Sept., 1913. No. 45420 E.

Geology of the Panama Isthmus and the Caribbean Archipelago. An interesting explanation of the geological changes which rendered it possible to

construct the Panama Canal. 2000 w. Engng—Aug. 22, 1913. No. 44921 A.

The Truth About the Culebra Cut Slides, Panama Canal. A. S. Zinn. Describes the nature of the earth slides and criticizes the plan proposed by George S. Rice. Also, short article by Donald F. McDonald. 3000 w. Eng News—Aug. 28, 1913. No. 44883.

Earthquakes and the Panama Canal. Donald F. MacDonald. A study of the geological conditions on the isthmus and what they indicate. Ills. 2500 w. Sci Am—Oct. 18, 1913. No. 45920.

The Earthquake at Panama. Editorial discussion of the geology of the region and the possible effect of earthquakes on the Panama Canal. 1800 w. Engng—Oct. 10, 1913. No. 45984 A.

On Landslides Accompanied by Upheaval in the Culebra Cut of the Panama Canal. Vaughan Cornish. Read before the British Assn. Describes the upheavals and landslides that have given so much trouble, discussing the causes and the outlook. 2500 w. Engng—Sept. 26, 1913. No. 45741 A.

Some of the Economic Effects of the Panama Canal. Prof. Kirkaldy. Abstract of a paper read before the British Assn. Briefly considers the local effects, and the effect on world trade. 1500 w. Jour Soc of Arts—Oct. 17, 1913. No. 45238 A.

The Engineering Aspect of the Panama Canal at the Present Time, 1913. William T. Taylor. Briefly reviews the history of Panama and of the canal, describing the engineering features, proposed method of operation and related subjects. Ills. 7000 w. Jour Soc of Arts—Oct. 3, 1913. No. 45829 A.

See also Rock Slides, under *Construction*; and Coal Trade under *MINING AND METALLURGY*, Coal and Coke.

Paris

Straightening the Walls of a Number of River Roads along the Seine through Paris (Transformation en ports droits d'un certain nombre de ports en tirage de la Seine dans la traversée de Paris). M. Arana. Details of retaining walls built for improving the river and straightening the channel. Ills. and Plates. 11000 w. Ann de Ponts et Chaussées—Sept.-Oct., 1912. No. 37490 E + F.

Piers

Structural and Mechanical Features of a Railroad Freight Pier. Illustrated description of a pier at Hoboken, N. J., for the D., L. & W. R. R. A fireproof steel and cement structure with cinder-filled deck, and mechanical equipment for handling freight. 2000 w. Eng Rec—May 24, 1913. No. 42379.

Piers

WATERWAYS AND HARBORS

River Control

New Freight Pier at Communipaw, N. J. Illustrated description of a modern fireproof structure of concrete and steel construction for the reception and storage of export business. 1500 w. *Ry Age Gaz*—May 9, 1913. No. 41947.

The New York Pier Problem. Map and explanation of existing conditions, and an account of the towing tests made in the experimental tank at the Washington Navy Yard. 3000 w. *Engr, Lond*—May 16, 1913. No. 42543 A.

Modern Pier Construction in New York Harbor. Charles W. Staniford. Discusses the growth and development of the harbor, the types of pier construction, new pier construction practice, column foundations, and requirements. Ills. 4000 w. *Pro Am Soc of Civ Engrs*—May, 1913. No. 42912 F.

Modern Pier Construction in New York Harbor. Discussion of the paper by Charles W. Staniford. 5000 w. *Pro Am Soc of Civ Engrs*—Sept., 1913. No. 45527 F.

Modern Pier Construction in New York Harbor. Continued discussion of the paper by Charles W. Staniford. Ills. 5500 w. *Pro Am Soc of Civ Engrs*—Oct., 1913. No. 46346 F.

Commonwealth Pier, Boston. Illustrated description of an exceptionally long pier, constructed in six months. 1800 w. *Munic Jour*—June 5, 1913. No. 42675.

Commonwealth Pier 5, Boston. Drawings and description of a 400 by 1200 ft. pier, with a two-story steel shed on solid fill and pile foundations between docks 40 ft. deep. Ills. 2000 w. *Eng Rec*—Sept. 6, 1913. No. 44999.

Pier for the Outer Harbor at Chicago. Gives particulars of the pier construction as shown by the plans and specifications just issued. Drawings. 700 w. *Eng News*—Sept. 18, 1913. No. 45222.

Coal Piers on the Atlantic Seaboard. A report on the plants at New York, Philadelphia, Baltimore and Norfolk, their construction, operation, cost, and other information. Ills. 13000 w. *Pro Am Soc of Civ Engrs*—Oct., 1913. No. 46342 F.

See also Foundations, under *Bridges*. Reinforced-Concrete Pier at Port au Prince, Haiti. Illustrates and describes a structure 2326 feet long. 1200 w. *Eng Rec*—May 31, 1913. No. 42646.

Calculation on Pier Walls (Berekening van kaaimuren). M. E. H. Tjaden. The derivation of formulæ for determining the thickness of such sea walls. Ills. 4500 w. *De Ingenieur*—Jan. 25, 1913. No. 40577 D.

See also Foundations, under *Bridges*.

Portland, Ore.

Portland, Oregon: Its Channel, Approach, Harbor, Railroad Facilities, Navigable Waterways, and Tributary Territory. G. B. Hegardt. Map, drawings and description. 16000 w. *Jour Assn of Engng Socs*—Jan., 1913. No. 39358 C.

Ports

Strasbourg's River Ports (Le Port Flurial de Strasbourg). Charles Aubert. The importance of its location on the Rhine with connecting canals to the Marne and the Rhone, and a review of the tonnage handled. Ills. 4500 w. *Genie Civil*—Nov. 2, 1912. No. 37519 D.

The Port of Antwerp (Il porto marittimo di Anversa). Cesare Chiodi. Review of the mechanical features for loading and unloading at this port, with brief mention of recent improvements. Ills. Serial, 1st part. 1500 w. *Monit Tecnico*—Dec. 20, 1912. No. 39094 D.

Construction at the Port of Antwerp (Der Ausbau des Hafens von Antwerpen). W. Kaemmerer. Brief outline of the work under construction. Ills. 1500 w. *Zeitschr des Ver deutscher Ing*—Jan. 11, 1913. No. 40041 D.

Bulkhead and Pier for the New Port of San Diego, Calif. Describes improvements under construction at this Pacific port. Ills. 1700 w. *Eng News*—March 13, 1913. No. 40654.

Reviews of 1912

Harbors and Waterways, 1912. Reviews the work of the past year in the United Kingdom. 4000 w. *Engr, Lond*—Jan. 3, 1913. Serial. 1st part. No. 39161 A.

Rhône

Report on Navigable Waterways in the Rhone Valley (Rapport sur les voies navigables de la vallée du Rhône). Ch. Levand. Discusses present and future canalization projects along the Rhone and its tributaries. Plate. 30700 w. *Mem Soc Ing Civ de France*—Oct., 1912. No. 38481 G.

See also Toronto, under *Waterways and Harbors*.

River Banks

Transverse Banks and Their Influence on Rivers (La pente transversale et son influence sur l'état des rivières). R. H. Gockinga. Especially considering the action of the banks on curves; distinguished from longitudinal banks. Ills. 8000 w. *Ann d Ponts et Chaussées*—Jan., 1913. No. 41508 E + F.

River Control

The Control of Rivers by Storage Reservoirs. Gives recent examples of effective works, taken from a report made by the Flood Commission of Pittsburgh.

River Improvement.**WATERWAYS AND HARBORS****Seine**

2500 w. Engr, Lond—May 16, 1913. No. 42542 A.

River Improvement

Medway Improvements. Map and illustrated description of a scheme, costing about 40,000£, for the improvement of navigation on this river in England. 1500 w. Engng—Nov. 22, 1912. No. 38029 A.

The Improvement of the Cuyahoga River at Cleveland, Ohio. From the recently issued report of the commission appointed to investigate the question. Outlines the most feasible projects. Map. 1500 w. Eng News—March 20, 1913. No. 40742.

The Improvement of the Neponset River in Massachusetts. Edmund M. Blake. Information concerning bids received and plans for the work, giving hydraulic data for the proposed new channel, and related matters of interest. Ills. 1500 w. Engng & Con—March 12, 1913. No. 40450.

River Improvement. E. T. Ireson. Gives five principal divisions of river improvement, discussing methods. 6000 w. Ap Sci—Sept., 1913. No. 46115 C.

See Dams, under *Water Supply*.

River Navigation

See also Flood Reservoirs, under *Waterways and Harbors*.

River Regulation

River Cleaning and Regulation in Germany. Charles Saville. Read before the Am. Pub. Health Assn. Explains conditions in the Emscher district, the formation of the Emscher Federation and the statute under which it operates. 3500 W. Eng Rec—Nov. 9, 1912. Serial. 1st Part. No. 37354.

The Ottawa River Storage Systems. J. A. Macdonald. Describes a scheme to study the flow for the production of power, to increase the depth for navigation, and to improve the potability of the water. 1200 w. Can Engr—Aug. 7, 1913. No. 44281.

See also Floods, under *Waterways and Harbors*.

Rotterdam

Enlargement of the Rotterdam Harbor in the Last Five Years (De uitbreiding van de Rotterdamse haven in de laatste 5 jaren). A. C. Burgdorffer. A comprehensive statement of the classes of work done in this large undertaking, including dredging, retaining walls, buildings, etc. Ills. and plates. 15600 w. De Ingenieur—April 19, 1913. No. 42163 D.

Sand Bars

The Transport and Settlement of Sand in Water, and a Method of Exploring Sand Bars. J. S. Owens. Read before the British Assn. Describes phenomena

accompanying the transport and settlement of sand in water. 2500 w. Engr, Lond—Sept. 26, 1913. No. 45748 A.

San Francisco

Port Improvements at San Francisco. Frank G. White. General description of past, present, and proposed developments. 2500 w. Eng Rec—July 12, 1913. No. 43661.

San Francisco Wharf and Dock Construction. Jerome Newman. Illustrated account of improvements under way and proposed. 2000 w. W Engng—July, 1913. No. 44044 C.

San Pedro, Calif.

Harbor Development at San Pedro, California. G. C. Munoz. Gives construction details of the wharves in the outer harbor of Los Angeles, with a brief description of the whole port. Ills. 18000 w. Eng Rec—May 17, 1913. No. 42219.

Seattle

Harbor Development in Seattle. William L. Kidston. Illustrated general outline of six projects being undertaken by the port commission. 2000 w. Eng Rec—Aug. 23, 1913. No. 44550.

Sea Walls

Reinforced Concrete Sea Defences. John Switzer Owens and Frederick James Wood. Describes work on the Sussex coast, England. Ills. 7000 w. Inst of Civ Engrs—No. 3998. No. 39295 N.

The Municipal Quay Wall, Oakland, California. Thomas E. Risley. Illustrates and describes a wall of the gravity type and its construction. 1200 w. Eng News—Feb. 13, 1913. No. 39861.

Sedimentation

The Settlement and Transport of Sand in Water. Dr. J. S. Owens. Read before the Geol. Sec. of the British Assn. Describes experiments on the effect of temperature of water upon the rate of settlement of sand, and on the rate of transport of sand along the bottom and its accompanying relation to the velocity of the current. 3500 w. Engng—Dec. 20, 1912. No. 38893 A.

Observations on the Deposition of Gravel in Canals and Streams (Observations sur les dépôts de graviers dans les canaux et les cours d'eau). M. Hoc. Comprehensive study on sedimentation with concrete examples. Ills. Serial, 1st part. 5600 w. Genie Civil—Jan. 4, 1913. No. 39088 D.

Seine

The Maritime Seine and the Port of Rouen (La Seine maritime et le Port de Rouen). L. Sekutowicz. The progress realized in the development of navigation since 1900, and the work projected. Ills.

Shore Protection

5500 w. Genie Civil—July 26, 1913. No. 45343 D.

Shore Protection

Methods and Cost of Mattress Construction and Abattis Dike Work on the Lower Mississippi. Sketch maps and description of work with cost data. 5500 w. Engng & Con—Nov. 13, 1912. No. 37561.

Method and Cost of Revetting Bank of Missouri River at Williston, N. D. W. B. Irwin. Illustrated description of a brush mat protection devised for this work. 1600 w. Engng & Con—Oct. 30, 1912. No. 37199.

Prevention of Percolation Through the White Oak Levee, Mississippi River, by Dove-Tailed Sheet-Piling. Brief illustrated description of a new form of levee construction. 600 w. Engng & Con—Oct. 30, 1912. No. 37198.

Protective Work on the Isar Bluffs near Munich (Die Sicherungsarbeiten an der Isarsteilhängen bei München). Herr Bosch. Describes the various types of revetment and other devices used to prevent scour. Ills. 2800 w. Beton u Eisen—Oct. 21, 1912. No. 37429 E.

A Simple and Inexpensive Form of River Bank Protection Against Scour. Arthur Goldstar in the *Iowa Engr.* Describes diversion dams used to solve this problem. Ills. 600 w. Engng & Con—Dec. 18, 1912. No. 38316.

Open Pile Dams and Reinforced-Concrete Revetments on the Missouri and Mississippi Rivers (Offene Pfahldämme und Ufersicherungen aus Eisenbeton am Missouri und Mississippi). M. von Pagenhardt. Describes methods of erecting pile dams and concrete facings. Ills. 2200 w. Zeitschr des Ver deutscher Ing—Dec. 14, 1912. No. 39036 D.

Concrete Bank Protection for Deep Rivers. B. Okazaki. Describes work on a deep river by using a concrete mattress. Ills. 1500 w. Eng News—March 13, 1913. No. 40656.

Foreshore Protection by Reinforced Concrete Groins. John S. Owens and Frederick James Wood. Abstract of a paper before the Inst. of Civ. Engrs. Describes works on the Sussex coast of England. Ills. 2500 w. Eng News—April 3, 1913. No. 41067.

Recent Plans for the Protection of Sea Coasts and the Banks of Rivers and Canals (Moderne opere di difesa per le spiagge marine, per le sponde dei fiumi e dei canali). Suggested revetments, using reinforced concrete. Ills. 2800 w. Il Cemento—March 15, 1913. No. 41532 D.

Methods and Costs of Building Shore Protections on the Upper Mississippi

WATERWAYS AND HARBORS

Terminals

River. Charles W. Durham. Illustrated description of methods used, with statement of cost. 3000 w. Engng & Con—April 9, 1913. No. 41193.

The Use of a Plank or Lumber Apron Mat for Shore Protection on the Upper Mississippi River. Charles W. Durham. Describes the use and construction of plank mats, made necessary by the scarcity of brush. Ills. 1500 w. Engng & Con—Aug. 13, 1913. No. 44349.

See also Reclamation, under *Construction*, and Levees, under *Waterways and Harbors*.

South Africa

South African Railways and Harbors. W. W. Hoy. Information from the annual report for 1912. 4000 w. Ry Gaz, Lond—Oct. 10, 1913. No. 45974 A.

South America

New Large South American Harbors (Les grands ports récents de l'Amérique du Sud). Alfred Jacobson. Describes the improvements at the ports of Para, Pernambuco and Bahia. Ills. Serial. 1st part. 6000 w. Genie Civil—May 3, 1913. No. 42194 D.

Stream Gaging

Artificial Control for Stream Gaging Stations. C. Robert Adams. Describes an innovation for determining the flow of small streams in rough beds. Ills. 2000 w. Eng News—June 26, 1913. No. 43312.

Submarine Excavation

Rock Excavation at Sydney Harbor, Australia. A. P. Smith. Illustrated description of methods of submarine rock excavation, potting for piles, and other uses of compressed air. 1500 w. Compressed Air—Aug., 1913. No. 44338.

Method and Costs of Drilling and Blasting Subaqueous Flint Rock. J. E. Hall. Describes drilling and blasting a channel in the Tennessee River. Ills. 2500 w. Engng & Con—Oct. 8, 1913. No. 45751.

Terminals

What Constitutes a Steamship Terminal. H. McL. Harding. Abstract of a paper read before the Nat. Rivers & Harbors Congress. Considers the elements of a successful terminal for water transportation. 3000 w. Int Marine Engng—Jan., 1913. No. 38812 C.

The Hughes Terminal on the Delaware River at Philadelphia. H. McL. Harding. Information concerning a proposed terminal. Plans. 2000 w. Eng News—Feb. 13, 1913. No. 39859.

An Ocean Terminal for the South. L. C. Talmage. Illustrated description of Texas City harbor developments. 1500 w. Sci Am Sup—Feb. 22, 1913. No. 40109.

Consult Classification of the Index. See page 9.

Tidal Lands

Tidal Lands

The Use of Vegetation for Reclaiming Tidal Lands. Gerald O. Case. An explanation of how plants and trees prevent coast erosion, arrest the sand and build up land. 3000 w. Engng—Aug. 22, 1913. Serial, 1st part. No. 44923 A.

Tidal Phenomena

Tidal Phenomena in the Harbor of New York. H. de B. Parsons. A study of the tidal actions, with maps, diagrams and tables. 20000 w. Pro Am Soc of Civ Engrs—April, 1913. No. 41646 F.

Tidal Phenomena in the Harbor of New York. Discussion of the paper by H. de B. Parsons. Map & Ills. 3000 w. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44790 F.

Toronto

Toronto Harbor Improvement. Plan and illustrated description of proposed improvements. 3500 w. Can Engr—Nov. 21, 1912. No. 37775.

Towage

An Interesting Proposal for Electric Traction on the Canals of Pavia (Una interessante proposta di trazione elettrica sul Naviglio Pavese). Mario Beretta. A suggestion for towing by means of a trolley system along the canal banks. Ills. 5000 w. Monit Tec—May 30, 1913. No. 43093 D.

United States Waterways

Water Transportation, Rail Rates and the Inter-State Commerce Commission. John Ruddle. Considers the principles of economics that should be applied and discusses from an economical point some features bearing upon the development of waterways. 3000 w. Int Marine Engng—Nov., 1912. No. 37171 C.

MISCELLANY

Design

Waterfronts

The Development of the Oakland, Cal., Municipal Waterfront. William Clyde Willard. Map, illustrations and account of the development. 5500 w. Engng & Con—July 16, 1913. No. 43820.

Waterways

The South's Interest in Improved Waterways. Joseph E. Ransdell. Explains the need of improving this well watered country. 2000 w. Mfrs' Rec—March 27, 1913. No. 41557 N.

Wave Action

Ocean Waves, Sea-Beaches, and Sandbanks. Vaughan Cornish. The present number considers the height, length, and speed of the highest waves produced in deep sea by a wind of given velocity. 3500 w. Jour Soc of Arts—Nov. 1, 1912. Serial, 1st part. No. 37385 A.

Wharf-Bulkhead

An Economical Wharf-Bulkhead. William M. Torrance. Illustrated description of a novel structure at Savannah, Ga., constructed of reinforced concrete on timber piling. 1000 w. Eng News—Oct. 9, 1913. No. 45799.

Wharves

Concrete Quay Wall on a Coral Foundation. Illustrated description of a quay wall recently built at the Key West Naval Station, Florida. 1500 w. Eng Rec—Nov. 9, 1912. No. 37358.

Quay Extension Works at Newcastle-upon-Tyne. Hubert Laws. Read before the Inst. of Munic. & Co. Engrs. Plans and detailed description of recent improvements. 6000 w. Surveyor—May 9, 1913. No. 42279 A.

MISCELLANY

Agriculture

Farming with Dynamite. Xeno W. Putnam. Illustrated account of a novel use for explosives. 3500 w. Cassier's—July, 1913. No. 43351.

Alaskan Boundary

The Settlement and Survey of the Alaskan Boundary. J. A. Flemer. A review of the indeterminate nature of the boundary from the purchase description; the work of the Boundary Commission, and the methods adopted in the survey. Ills. 5000 w. Engineering Magazine—May, 1913. No. 41631 B.

America

American Engineering in 1912. The present number reviews the iron and steel industry, mechanical engineering, mining, irrigation and drainage, rivers, canals and docks, and marine engineering. 4500 w.

Engr, Lond—Jan. 31, 1913. Serial, 1st part. No. 39814 A.

British Parliament

Engineering Schemes in Parliament, 1913. Reviews the schemes, other than railways, which are being promoted. 3000 w. Engr, Lond—Jan. 17, 1913. No. 39488 A.

Caisson Disease

A Symposium on Caisson Disease. Official abstracts of papers, presented before the Int. Cong. on Hygiene and Demography. The state of the art and possible improvements are considered. 2000 w. Eng News—Nov. 7, 1912. No. 37318.

Design

The Competition for Survival Between Differing Types of Engineering Design. Walter Fisher. Discusses competing

Consult Classification of the Index. See page 9.

Forest Fires

ideas in engineering fields. 2500 w. Cornell Civ Engr—Oct, 1913. No. 46295 C.

Forest Fires

Forest Fires: Their Causes, Extent and Effects, with a Summary of Recorded Destruction and Loss. Fred G. Plummer. Ills. 39 pp. U S Department of Agriculture Bul. 117—Oct. 23, 1912. No. 37881 N.

Methods and Apparatus for the Prevention and Control of Forest Fires, as Exemplified on the Arkansas National Forest. Daniel W. Adams. Describes methods used. Ills. 27 pp. U S Dept of Agri, Bul. 113—Nov. 8, 1912. No. 37880 N.

Forestry

Forestry Work of U. S. Government. Reviews the work of the Department of Agriculture in forest protection and development. 2500 w. Eng Rec—Dec. 21, 1912. No. 38321.

Forests

Forests and Their Effect on Climate, Water Supply and Soil. J. C. Stevens. Treats the subject of precipitation, runoff, erosion, etc., and the relation of the forests and gives data. 12700 w. Jour Assn of Engrg Socs—July, 1913. No. 43996 C.

Forest Service

Review of Forest Service Investigations. A résumé of the character and progress of the work. 92 pp. U. S. Forest Service, Vol. II—April 25, 1913. No. 42481 N.

Geology

Engineering Applications of Geology. Edwin C. Eckel. Discusses the influence on the topography, structure and materials. 2500 w. Eng Rec—June 14, 1913. Serial, 1st part. No. 42829.

India.

The Progress of Engineering in the East. First of a series of articles dealing with matters of engineering interest in India. Ills. 2500 w. Engr, Lond—Feb. 21, 1913. Serial. 1st part. No. 40315 A.

Meteorology

The Importance of Meteorological

MISCELLANY

Data in Engineering. George S. Bliss. Outlines the importance of the work of the Weather Bureau showing the increasing use and value of the information furnished. Discussion. 4500 w. Pro Engrs' Club of Phila—April, 1913. No. 42363 D.

Montana

Annual Address. Robert A. McArthur. President of the Montana Society reviews the engineering progress in the State during 1912. 6500 w. Jour Assn of Engrg Socs—Aug., 1913. No. 44518 C.

Mosquitoes

The Habits of Mosquitoes. H. G. F. Spurrell. Shows the part played by mosquitoes in the transmission of disease, methods of destruction, and other information. 3800 w. Min & Sci Pr—Feb. 15, 1913. Serial, 1st part. No. 39965.

Mosquito Extermination

Mosquito Extermination and Its Problems. Eugene Winship. Describes the essentials of success and reviews the progress of the work. Ills. 4500 w. Eng Rec—May 3, 1913. No. 41845.

National Control

A National Board of Engineering Control. Two prize essays on the Formation of a National Engineering Service. 8500 w. Can Engr—Jan. 23, 1913. No. 39408.

Philippines

A Talk on the Philippine Islands. E. L. Lundgren. Explains the conditions and government, describes the engineering work, and gives interesting information. Ills. Short discussion. 4000 w. Jour W Soc of Engrs—Dec., 1912. No. 39336 D.

Research

Concerning Engineering Research—the Useless and the Useful. Editorial criticism, illustrating points discussed by examples. 2500 w. Eng News—July 3, 1913. No. 43437.

Sand Dunes

Sand Dunes. Illustrated account of how they are reclaimed in Europe and in the United States. 1000 w. Sci Am—June 28, 1913. No. 43200.

ELECTRICAL ENGINEERING

COMMUNICATION	130
DISTRIBUTION	135
DYNAMOS AND MOTORS.....	137
ELECTRO-CHEMISTRY	146
ELECTRO-PHYSICS	151
GENERATING STATIONS	156
LIGHTING	167
MEASUREMENT	174
POWER APPLICATION	179
TRANSMISSION	184
MISCELLANY	194

Antennae

Antennae

Experiments with Umbrella Antenna. Joseph O. Mauborgne. Also editorial. Gives results of a series of tests on radio-transmission efficiencies from this type of antenna. 2000 w. Elec Wld—Jan. 4, 1913. No. 38834.

Antenna Resistance. L. W. Austin. Describes methods of investigation employed. 1000 w. Bul Bureau of Stand—March 15, 1913. No. 42933 N.

Automatic Exchanges

Recent Developments in Automatic Exchange Telephone Systems. G. H. Green. Describes the fundamental principles of modern systems and gives details of the 3-wire and 2-wire Strowger systems and features of interest in recently opened exchanges. Ills. 2500 w. Elect'n, Lond—Nov. 8, 1912. Serial. 1st part. No. 37634 A.

Combined Service

The Joint Use of Wires for Telephone and Telegraph Service. H. S. Warren. Discusses the possibilities of increased efficiency and economy by coöperation between these two systems of communication. Diagrams. 1200 w. Elec Jour—Sept., 1913. No. 45099.

Conductors

Inductance and Capacity of Linear Conductors and the Determination of the Capacity of Horizontal Antennae. Louis Cohen. Derives expressions for the capacities of various arrangements of linear conductors, and formulæ for the antennae. 1500 w. Elect'n, Lond—Feb. 14, 1913. Serial, 1st part. No. 40117 A.

Development

Telegraphy, Telephony and Signalling (Telegraphie, Telephonie und Signalwesen). Rudolf Franke. A very brief comparison of early and later systems. 2100 w. Elek u Masch (Special)—March, 1913. No. 41496 D.

Earth Antennae

Transmission Experiments with Earth

COMMUNICATION

Paris

Antennae. F. Kiebitz. Abbreviated translation. Explains methods used and gives results of experimental investigation. 2500 w. Elect'n, Lond—July 18, 1913. No. 43955 A.

Exchanges.

The Semi-Automatic Telephone Exchange in Amsterdam (De half-automatische telefooninrichting van Amsterdam-Zuid). W. A. J. van den Hurk. Detailed description of this installation. Ills. 8500 w. De Ingenieur—Jan. 4, 1913. No. 40575 D.

Fire Alarms

Milwaukee Fire and Police Alarm. W. S. Burnett. Describes the fire and police alarm system and its activities, the equipment of the department and the duties of the employers. Ills. 4000 w. Munic Jour—Jan. 2, 1913. No. 38788.

Great Britain

The Postmaster-General's Annual Report. Extracts referring to telegraphy, wireless telegraphy, and telephony. 5800 w. Elect'n, Lond—Dec. 13, 1912. (Special.) No. 38844 D.

Interference

Progress Report on Study of Inductive Interference. Describes equipment and thorough tests made by Committee of Calif. Engrs. 2000 w. Telephony—Oct. 18, 1913. No. 45951.

Longitude

Determination by Radio-telegraphy of the Difference of Longitude Between Paris and Bizerte. M. M. Lancelin and Tsatsopoulos, under direction of M. H. Renan. Description and installation of the instruments and of the apparatus. 13500 w. Pro U S Nav Inst—Sept., 1913. Serial, 1st part. No. 45424 E.

Paris

The Extension of the Telephone System in Paris (L'extension du réseau téléphonique de Paris). G. Viard. Detailed description of the recently completed inter-

Consult Classification of the Index. See page 9.

Radiotelegraphy

urban bureau. Ills. 4800 w. Genie Civil—July 12, 1913. No. 43579 D.

Radiography

The International Radio Conference of London. D. W. Todd. Report of this conference where 29 nations were represented. 8500 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38304 H.

Efficiency of "Earths" in Radio-telegraphy. Charles A. Culver. Report of experimental investigations. 1200 w. Elec Wld—Dec. 21, 1912. No. 38357.

Signal Practice in Modern Radiotelegraphy (Cenni pratici sui moderni apparati radiotelegrafici). G. Pession. Discussion on sending and receiving apparatus. Ills. 16000 w. Rivista Marittima—Oct., 1912. No. 38494 E + F.

Radiometry

Instruments and Methods Used in Radiometry. W. W. Coblenz. Aims to give the latest attainments in the construction of instruments used in measuring spectral radiation. Ills. 15600 w. Bul Bureau of Stand—March 15, 1913. No. 42932 N.

Radiotelegraphy

Some Developments in Wireless. John Hays Hammond, Jr. The present number discusses the problem of selectivity, and present success in avoiding interference. 1500 w. Sci Am—Nov. 23, 1912. Serial. 1st Part. No. 37733.

Sparkless Wireless Telegraphy (La télégraphie sans fil sans étincelles). G. Duparc. Present efforts by American and German specialists to obtain oscillations of 50,000 per second, and the effect of such periodicity. Ills. 3700 w. Genie Civil—Oct. 12, 1912. No. 37515 D.

Directive Wireless Telegraphy. F. Addey. Abstract of paper read before the Inst. of P. O. Elec. Engrs. Discusses their chief uses and describes methods. 2200 w. Elect'n, Lond—Dec. 27, 1912. No. 38909 A.

Bridging Australia by Wireless. Dr. Alfred Gradenwitz. Illustrates and describes the new station at Fremantle, which communicates with Sydney, a distance of 2500 miles. Elec Rev, Lond—Jan. 3, 1913. No. 39136 A.

International Time and Weather Radio-Telegraphic Signals. Wm. I. S. Lockyer. The action of the French government in distributing such signals is considered, describing two signals being daily distributed from the Eiffel Tower, Paris, and from Norddeich-Wilhelmshaven, showing the different systems. Explains the full international system to be put into operation July 1, 1913. 2200 w. Nature—March 13, 1913. No. 40800 A.

The "Lodge-Chambers" System of

COMMUNICATION

Wireless Telegraphy. F. J. Chambers. Illustrated detailed description. 2200 w. Elect'n, Lond—March 14, 1913. Serial. 1st part. No. 40810 A.

The Arlington Radio Station. D. W. Todd. Illustrated detailed description of this station and its equipment, with related subjects of interest. 6500 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40859 H.

United States Navy Wireless Station. S. M. Kintner, E. D. Forbes, F. H. Kroger, and J. L. Hogan, Jr. Describes service trials and operating features of the high-powered radio station at Arlington, Va. 2500 w. Elec Wld—April 5, 1913. No. 41108.

The Developments in Wireless Telegraphy (Die entwicklung der drahtlosen Telegraphie). Max Riethoffer. The work of Hertz, Marconi, Crookes and earlier investigators, and the present scope. 4000 w. Elek u Masch (Special) — March, 1913. No. 41497 D.

The Advisory Scientific Committee on Radio-Telegraphy. Gives report of the committee appointed by the Postmaster-General to consider the merits of the exciting systems of long distance wireless telegraphy. 4000 w. Elect'n, Lond—May 9, 1913. No. 42275 A.

Quantitative Results of Recent Radio-Telegraphic Tests Between Arlington, Va., and the U. S. S. "Salem." John L. Hogan, Jr. Considers features of interest in trials made to determine the reliable communication range. 4000 w. Elec Wld—June 21, 1913. No. 43105.

Wireless Telegraphy (La Télégraphie sans Fil). M. E. Girardeau. Discussing first, the application of resonance, and second, long distance, quick service operation. Ills. 11,000 w. Mem Soc Ing Civ de France—March, 1913. No. 43076 G.

Obligatory Equipment of Ships With Wireless Stations (Obligatorische Ausrüstung der Seeschiffe mit funkentelegraphischen Bordstationen). H. Thurn. The causes and enforcement of the laws requiring passenger ships to have adequate equipments. 4000 w. Schiffbau—May 28, 1913. No. 43023 D.

Development and Present State of Radiotelegraphy and Radiotelephony. (Sviluppo e stato attuale della radiotelegrafia e della radiotelefonía). Summary of an address by Prof. Giuseppe Vanni, outlining advanced work. Ills. 3500 w. Industria—June 22, 1913. No. 43589 D.

On a Dynamo for Maintaining Electrical Vibrations of High Frequency, with Some Notes on the Transmission of Waves in Wireless Telegraphy. Sir Oliver Lodge. Deals with Goldschmidt's

Radiotelegraphy

alternator, the advantages of long wavelength, and the causes of ionization in the air. 3000 w. Elect'n, Lond—Aug. 15, 1913. No. 44712 A.

The Imperial Wireless Chain Debate. Reports the debate on the approval of the Marconi agreement. 15000 w. Elect'n, Lond—Aug. 15, 1913. No. 44713 A.

The System "À Onde Unique" (?) of The Société Française Radio-Electrique. G. W. O. Howe. A system, involving an intermediate transforming circuit, in which it is claimed that a single wave is emitted with the closest couplings. Shows that such cannot be the case. 1500 w. Elect'n, Lond—July 25, 1913. No. 44167 A.

The New Marconi Agreement. Gives the "Treasury Minute" of July 30th, almost in full, with summary of the principal document. 11500 w. Elect'n, Lond—Aug. 8, 1913. No. 44449 A.

Wireless Telegraphy. E. C. Newton. Deals with the development of commercial wireless telegraphy. Ills. Discussion. 4000 w. Jour Cleveland Engng Soc—Sept., 1913. No. 45430 D.

Present Practice in Radio-telegraphy. S. M. Kintner. A brief statement of radio-telegraphy as practiced at present. Ills. 5000 w. Elec Jour—Sept., 1913. No. 45098.

Wireless and the Weather. A. H. Taylor. Reports investigations of absorption over land areas made at the Univ. of Dakota, which is 1,200 miles from each coast. 1500 w. Elec Wld—Aug. 30, 1913. No. 44879.

Practical Notes on Radio-telegraphic Transmission (Note pratiche circa i trasmettitori radiotelegrafici). G. Pession. Review of the mathematical theory and notes on construction. 8000 w. Rivista Marittima (Supplement) — July-Aug., 1913. No. 45360 E & F.

Atmospheric Refraction in Wireless Telegraphy. W. H. Eccles. Read before the British Assn. Gives an explanation of the refraction of electric waves round the earth. 2000 w. Elect'n, Lond—Sept. 19, 1913. No. 45558 A.

The Nature of the Electro-magnetic Waves Employed in Radio-telegraphy and the Mode of Their Propagation. G. W. O. Howe. Read before the British Assn. A mathematical study. 3500 w. Elect'n, Lond—Sept. 19, 1913. No. 45557 A.

Rulings for Public Wireless Service in Germany (Die Regelung des öffentlichen Funkentelegraphen-verkehrs in Deutschland). H. Thurn. A review of the laws relating to international service on ships and coastal stations. 3500 w. Schiffbau Aug. 27, 1913. No. 46048 D.

COMMUNICATION

Submarine Telegraphy

Recent Devices for the Transmission of Energy through Space without Connecting Wires (Neuere Einrichtungen zur Kraftübertragung in die Ferne ohne fort-hauchenden Leitungsdraht). W. Wolff. Describes the experiments by Wirth at Nuremberg on the control of torpedo boats, explosion of submarine mines, etc., by wireless. Ills. Serial, 1st part. 2000 w. Schiffbau—Sept. 10, 1913. No. 46050 D.

See also Antennae, and Wireless Stations, under *Communication*; Condensers, and Resonance, under *Electro-Physics*, and Navigation, under *MARINE AND NAVAL ENGINEERING*.

Signalling

Circuits for Elevator Signalling. Describes the standard system used in department stores in the present number. Ills. 1500 w. Elec Rev & W Elect'n—Jan. 18, 1913. Serial, 1st part. No. 39226.

Some Methods of Magnifying Feeble Signalling Currents. S. G. Brown. Discourse at the Exhibition of Apparatus of the Phys. Soc. Describes instruments designed for cable work, but applicable in other fields. Line drawings. 2200 w. Elect'n, Lond — Feb. 21, 1913. No. 40305 A.

See also Signal Systems, under *MINING AND METALLURGY, Mining*.

Signals

Burglar-Alarm Circuits. George Reed. Explains two systems of wiring for this special service. 1500 w. Elec Rev & W Electri—Feb. 15, 1913. No. 39881.

Submarine Cables

The Loading of Submarine Telephone Cables. J. G. Hill. A comparison between coil-loaded and continuously-loaded cables. 1500 w. Elec Rev, Lond—Nov. 29, 1912. Serial. 1st part. No. 38111 A.

Graphs in a Cable-Ship Drum-Room: Notes for Junior Assistants. Edward Raymond Barker. Discusses graphic methods applicable to drum-room routine work. 2000 w. Elec Rev, Lond—Jan. 17, 1913. Serial, 1st part. No. 39458 A.

The Submarine Telegraph Cable from Italy to Lybia (I cari telegrafici sottomarini dall'Italia alla Libia). Emanuele Jona. An account of the work of laying this cable across the Mediterranean. Ills. 3400 w. Industria—Feb. 9, 1913. No. 40612 D.

Sine-Wave Transmission in the Submarine Telegraph Cable. H. W. Malcolm. A mathematical study. 2000 w. Elect'n, Lond—Oct. 10, 1913. Serial, 1st part. No. 45971 A.

Submarine Telegraphy.

The Sounder in Submarine Telegraphy. Edward Raymond-Barker. Discusses the

Consult Classification of the Index. See page 9.

Telegraph Lines

COMMUNICATION

Telephony

invention of Mr. John Gott, which enables the ordinary Morse to be worked on long submarine cables. 2200 w. *Elec Rev*, Lond—Feb. 28, 1913. No. 40463 A.

The Methods of Submarine Cable Signalling. H. W. Malcolm. Considers the methods of the siphon recorder code, ordinary Morse code, the Gott form of Morse, and the Picard form of Morse. 2000 w. *Elect'n*, Lond—April 11, 1913. Serial. 1st part. No. 41379 A.

Telegraph Lines

The Construction of Telegraph Lines Between Surabaya and Wonokromo (De ombouw van de telegrafgeleiding tusschen Soerbaja en Wonokromo). J. Aanstoots. Details of the type of construction adopted for this tropical region in the Dutch Indies. Ills. 2700 w. *De Ingenieur*—May 24, 1913. No. 43052 D.

Telegraphy

The Siemens & Halske Electric Long-Distance Printing Machine (Der elektrische Ferndrucker der Firma Siemens & Halske). Rud. R. v. Heider. Operation and construction of device actuated by typewriter keys and transmitting the letters struck. Ills. Serial, 1st part. 4000 w. *Elek u Masch*—Jan. 12, 1913. No. 40057 D.

The Morse Telegraph. George C. Maynard. Address delivered at Washington, D. C., at the dedication of a bronze memorial tablet on the site of the first commercial telegraph office in the world. 2500 w. *Elec Rev & W Elect'n*—July 19, 1913. No. 43832.

Telephone Cables

The Gulf of Georgia Submarine Telephone Cable. E. P. La Belle and L. P. Crim. Describes the cable recently laid between Point Grey and Nanaimo, on Vancouver Island. Ills. 4000 w. *Pro Am Inst of Elec Engrs*—Sept., 1913. No. 45519 F.

Telephony

Depreciation and Replacement of Growing Telephone Plants. Burke Smith. Aims to show the effect of age, growth, and other phases of depreciation, applying especially to telephone properties. Discussion. 9500 w. *Jour W Soc of Engrs*—Oct., 1912. No. 37742 D.

A Method of Improving the Sensitiveness of the Telephone Receiver as a Detector in Alternating Current Null Measurements. Phillips Thomas. Describes a modification of the telephone detector which does away with the limitations ordinarily encountered in using the receiver as a detector. 1200 w. *Jour Fr Inst*—Dec., 1912. No. 38399 D.

Battery-Ringing Telephones. Diagrams and description of a system adapted espe-

cially for small installations. 1500 w. *Sci Am Sup*—Jan. 11, 1913. No. 39108.

Pioneers in Telephone Engineering. Thomas A. Watson. An account of experiences with the first telephones. Ills. 2200 w. *Sci Am Sup*—April 5, 1913. No. 41057.

Trunk Telephone Communication Transmission Schemes and the Design of Circuits. A. B. Hart and W. J. Hilyer. Abstract of paper read before the Inst. of P. O. Engrs. Discusses standards of reference for speech and transmission, best distribution of copper in line circuits, etc. 4500 w. *Elect'n*, Lond—April 11, 1913. No. 41377 A.

The Telephonic Development of the British Isles Considered in Relation to the Population. W. H. Gunston. From the *Post-Office Elec Engrs' Jour*. Interesting statistics. 1000 w. *Elect'n*, Lond—April 25, 1913. No. 41917 A.

A Note on High-Frequency Wave Filters. G. M. B. Shepherd. Considers the theory of wave filters and gives constructional particulars based on practical experience of such a filter for telephonic work. 1500 w. *Elect'n*, Lond—June 13, 1913. No. 43132 A.

Condenser Telephones. Karl Ort and Josef Rieger. Abstract from *Archiv für Elektro-technik*. An account of improvements and interesting experiments. Ills. 2000 w. *Elect'n*, Lond—June 6, 1913. No. 42880 A.

Practical Application of Telephone Transmission Calculations. A. J. Aldridge. Considers the theory of telephonic transmission from the non-mathematical point of view, describing apparatus for simplifying calculations and showing its applications. Ills. 7800 w. *Inst of Elec Engrs*—May 21, 1913. No. 42877 N.

Test of an Artificial Aerial Telephone Line at a Frequency of 750 Cycles per Second. A. E. Kennelly and F. W. Lieberknecht. Describes an artificial line and a series of tests upon it. Ills. 3500 w. *Pro Am Inst of Elec Engrs*—June, 1913. No. 43207 F.

Application of Mechanical Devices to the Assistance of Manual Operating in Telephone Exchanges. W. Slingo. Illustrates and describes experimental equipment installed for the British Post-Office. 3000 w. *Inst of Elec Engrs*—May 21, 1913. No. 42878 N.

Automatic Methods in Long Distance Telephone Operation. H. M. Friendly and A. E. Burns. Describes equipment for improving service. Ills. 8500 w. *Pro Am Inst of Elec Engrs*—June, 1913. No. 43215 F.

The Betulander Automatic Telephone

Telephony

COMMUNICATION

Wireless Towers

System. Brief illustrated description. 1800 w. Elec Rev, Lond—May 16, 1913. No. 42529 A.

The Inclusion of Dalmatia in the Austrian Telephone System (Die Einbeziehung Dalmatiens in das österreichische Telephonnetz). E. F. Petritsch. Necessity and difficulty attending the final construction of a submarine telephone cable to the province of Dalmatia. Serial, 1st part. 3200 w. Elek u Masch—July 6, 1913. No. 44686 D.

The Telephone Stations of the World at the Beginning of 1912. W. H. Gunston. From the *P. O. Elec. Engrs. Jour.* Statistics relating to telephone development. 2500 w. Elect'n, Lond—Sept. 5, 1913. No. 45144 A.

Traffic Distribution in Manual Telephone Exchanges. J. Baumann. Describes the selector-switch system of automatic traffic distribution and its applicability to any C. B. Telephone exchange. Ills. 4000 w. Elect'n, Lond—Aug. 29, 1913. No. 45031 A.

Some Telephone Traffic Problems and Their Solutions. Paul Bunce. Read before the N. Dak. Tel. Assn. Suggestions for securing efficiency in operating. 2000 w. Telephony—Oct. 18, 1913. No. 45952.

Modernizing the Telephone Feeder and Distribution Plant. Charles W. McKay. Discusses facilities for maintaining telephone service in cities of about 25000 population. 1500 w. Telephony—Oct. 18, 1913. No. 45950.

See also Railophone and Telephone Despatching, under RAILWAY ENGINEERING, Conducting Transportation.

Telephotography

Sending Photographs Over a Telephone Wire. Jacques Boyer. Illustrated description of the improved Bélin apparatus. 1200 w. Sci Am—Dec. 21, 1912. No. 38278.

Time Signals

Recording Time Signals from the Eiffel Tower to 1/100 Seconds (L'inscription des signaux horaires de la tour Eiffel au 1/100 seconde près). Albert Turpain. A review of the work and instruments used in accomplishing this phase of radiotelegraphy. Oscillograms and Ills. 5800 w. Rev Gen des Sciences—May 15, 1913. No. 42197 D.

Hertzian Time Signals (Les Signaux Hertiens de l'Heure). M. Turpain. The graphical registering of time signals in the fraction of a second from the sending station by the aid of extra-sensitive relays. Ills. 5600 w. Bull Soc Int d'Electriciens—April, 1913. No. 42187 F.

Application of Wireless Telegraphy to Time Signals. Commandant Ferrie. Ab-

stract of a paper read in Paris, May 24, 1913. Describes the manner of sending the signals and explains the advantages. 2500 w. Engng—June 6, 1913. No. 42887 A.

The Recording of Radiotelegrams and Its Application to Precise Geodesy (L'enregistrement des radiotélégrammes et son application en géodésie de précision). Albert Turpain. Explains the use of time signals for the determination of longitude. Ills. 2300 w. La Nature—May 23, 1913. No. 43055 D.

Towers

Wireless Telegraph Transmission Towers. James Stedman. Illustrates and describes the design and erection of the lofty sectional steel poles for a globe circuit of 3000-mile transmission stations. 800 w. Ir Age—Oct. 23, 1913. No. 46123 C.

Wireless Stations

The New Wireless Telegraph Station at Fort Myer, Virginia. Davis H. Tuck and Millard B. Hodgson. Illustrates and describes this station and outlines the work for which it was designed and equipped. 2000 w. Elec Rev, Lond—Dec. 20, 1912. No. 38862 A.

Wireless-Telegraph Station at Fort Myer, Va. D. H. Tuck and M. B. Hodgson. Illustrates and describes the structures and the work it is intended to accomplish. 1500 w. Elec Wld—Jan. 18, 1913. No. 39230.

Wireless Telephony

Wireless Telephone for Pit Use. O. Dobbelstein. Discusses some of the problems of such installations and the advantages. Ills. 1500 w. Ir & Coal Trds Rev—June 6, 1913. No. 42900 A.

Wireless Telephony (La téléphonie sans fil). Prof. Vanni. A description of the apparatus designed by the author, its operation, and account of its success in communicating between Rome and Tripoli. Ills. 5000 w. La Nature—May 17, 1913. No. 43054 D.

Some Novel Experiences in Wireless Telephony (Sur quelques expériences nouvelles de téléphonie sans fil). J. Vanni. A review of experiments conducted by the author and others in this field, and their successful results. Ills. 4900 w. Bull Soc Int d'Electriciens—May, 1913. No. 43566 F.

See also Radiotelegraphy, under COMMUNICATION.

Wireless Towers

Erecting Tall Wireless Towers at Arlington. Illustrated description of light steel towers 450 and 600 feet high erected by specially guyed derricks on wooden falsework with auxiliary steel towers.

Consult Classification of the Index. See page 9.

Wireless Transformers

2600 w. Eng Rec—Dec. 7, 1912. No. 38080.

Wireless Transformers

The Construction of a One-Kilowatt

COMMUNICATION**Grounding**

Closed Core Wireless Transformer. Illustrated description of the construction, explaining the advantages. 2500 w. Sci Am—Oct. 11, 1913. No. 45757.

DISTRIBUTION**Alternating Current**

The Distribution of Alternating Currents in Infinitely Expanded Plates (Ueber die Verteilung des Wechselstromes in unendlich ausgedehnten Platten). W. O. Schumann. Mathematical discussion. Serial, 1st part. 4000 w. Elek u Masch—July 27, 1913. No. 44692 D.

Circuit Breakers

Rating of Oil Circuit Breakers with Reference to Rupturing Capacity. George A. Burnham. Short paper advocating a universal method of rating oil circuit breakers, which will be devoid of as many variables as possible. 500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40185 F.

Developments in Circuit Breakers and Switchboards (Die Entwicklung der Ausschalter und der Schaltanlagen). Friedrich Patzelt. Brief sketch of improvements adopted from the original forms. Ills. 2000 w. Elek u Masch (Special)—March, 1913. No. 41486 D.

Recent Developments in Oil Circuit Breakers. J. H. Mahoney. Discusses general points of design, the functions, operating mechanism, &c., illustrating and describing types. 3000 w. Elec Jour—Aug., 1913. No. 44593.

Notes on Oil Circuit Breakers for Large Powers and High Potentials. K. C. Randall. A brief outline of some of the important developments in oil circuit breakers within the last two or three years for the largest powers and highest potentials. Ills. 1000 w. Pro Am Inst of Elec Engrs—Oct., 1913. No. 46337 F.

Circuits

Telephonic Circuits Over Long Spans Compared with Electric Power Transmission Lines (Les Circuits téléphoniques à longue portée comparés aux Lignes électriques de Transport de force). Paul Drumaux. A study of the oscillatory phenomena of industrial lines and their relation to telephone lines. Ills. 9600 w. Soc Belge d'Electriciens—June, 1913. No. 45305 E.

A Model for Demonstrating Some of the Effects Obtained in Coupled Oscillating Electrical Circuits. E. W. Marchant. Illustrated description. 1200 w. Elect'n, Lond—Sept. 26, 1913. No. 45730 A.

City Lines

Underground Distribution for Small

Cities. S. Bingham Hood. Outlines a type of underground distribution which has been successfully installed in Toronto. Ills. 5000 w. Can Elec Assn—June, 1913. No. 44812 N.

Conduits

Notes on Underground Conduit Construction. Guy F. Speer. Illustrates and describes methods used in New Jersey, which reflect modern practice, especially in the laying of fiber conduit. 1800 w. Elec Wld—Jan. 4, 1913. No. 38835.

The Construction of Underground Pipe Lines for Electric Cables. Francis H. Davies. Helpful suggestions for wiring. 2500 w. Elec Rev & W Elect'n—Feb. 15, 1913. No. 39880.

Installation of Rigid-Conduit Work in Buildings of Concrete Construction. G. N. McCarthy. Illustrated directions for the work. 3000 w. Elec. Rev. & W Elect'n—Oct. 11, 1913. Serial, 1st part. No. 45795.

Converters

Modern Converting Machinery. Illustrates and describes forms of converting machinery, showing how it should be connected up and worked to the best advantage. 3500 w. Engr, Lond—June 13, 1913. Serial, 1st part. No. 43148 A.

Currents

Current Distribution Over and Beyond a Junction Points (Stromverlegung über und nach Knotensjunkten). H. Frohman. Mathematical discussion. Diagrams. Serial, 1st part. 2800 w. Elek u Masch—March 23, 1913. No. 41478 D.

Field Distribution

Notes on Electric Field Distribution. W. S. Franklin. Diagrams and discussion of the production of any desired field distribution. 2500 w. Jour Fr Inst—July, 1913. No. 44030 D.

Fuse

Electric Fuse Testing. A. A. Somerville. Gives results of an investigation of the advantages and disadvantages of the electric fuse. 1500 w. Elec Wld—Jan. 18, 1913. No. 39229.

Grounding

Grounded Y versus Isolated Delta from the Point of View of the Systems in the Southwest. Chester W. Rice and S. Thomson. Shows the advantages, from the standpoint of continuity of service, of the dead grounded neutral. 2500 w. Gen Elec Rev—Oct., 1913. No. 45583 C.

Consult Classification of the Index. See page 9.

Mine Wiring

Mine Wiring

Electric Cables in Mines. G. W. T. Anderson. Read before the Manchester Geol. & Min. Soc. Discusses types of cable and their relative efficiency, installing, types of shaft suspension, etc. Ills. 3000 w. Col Guard—Feb. 14, 1913. Serial, 1st part. No. 40127 A.

Oil Switches

Some Notes on Oil Switch Arrangements. Emil Bern. Reviews the evolution of the control and layout of oil switches. 1000 w. Gen Elec Rev—Feb., 1913. No. 39616 C.

The Testing of an Oil Switch. M. Vogelsang. Abstract of an article in *Electrotechnische Zeit.* Describes tests that were made in a power station in Norway with conclusions. Ills. 1500 w. Elect'n, Lond—June 27, 1913. No. 43625 A.

Parallel Operation

Some Factors in Parallel Operation. A. R. Everest. Notes aiming to show how to avoid "hunting." 3000 w. Inst of Elec Engrs—Feb., 1913. No. 40099 N.

Power Distribution

Transmission of Electric Power. L. R. Pomeroy. The flow of water from pumps is used to explain the various systems of electric distribution. Ills. 3000 w. Am Engr—April, 1913. No. 41089 C.

Regulators

Developments in Regulator and Starting Appliances, Hoists, Cranes and Lifting Magnets (Die Entwicklung der Regulier und Anlassapparate, Aufzüge, Krane, Hebmagnete). F. Natalis. Lines of improvement in recent years, and their origins. 2400 w. Elek u Masch (Special)—March, 1913. No. 41487 D.

The Regulator Problem in Electro-Technology (Das Regulierproblem in der Elektrotechnik). A. Schweiger. A summary of the early attempts to solve the problem, and the work done by the various investigators. 4400 w. Elek u Masch (Special)—March, 1913. No. 41488 D.

Automatic Voltage Regulation. W. J. Belsey. Read before the Assn. of Univ. Elec. Engrs. Considers briefly several types of regulators, losses in generator fields, line losses, effect of voltage variation on lamps, etc. 3000 w. Ir & Coal Trade Rev—May 2, 1913. No. 42252 A.

The Tirrell Regulator. John A. Randolph. Diagrams and description of arrangement on alternating-current switchboard and with direct-current generator. 2000 w. Power—Oct. 7, 1913. No. 45701.

Relays

Practical Installation of Relays on Alternating-Current Circuits. C. E. Freeman. Suggestions as to their installa-

DISTRIBUTION

tion and adjustment. 3000 w. Elec Wld—Nov. 2, 1912. No. 37281.

Switchboard Relays and Their Application. D. Basch. First of a series of articles discussing in detail the types, construction and application of relays. Ills. 4000 w. Gen Elec Rev—April, 1913. Serial. 1st part. No. 40990 C.

Switchboards

Switchboards for Alternating-Current Power Stations—General. C. H. Sanderson. A comparative discussion of the three classes suitable for A. C. stations and the factors influencing choice. Ills. 4000 w. Elec Jour—Jan., 1913. No. 39442.

Some Notes on Switchboard Design. Emil Bern. Reviews principally the requirements which have caused the development of the bench type of board, describing the construction and layout of types. Ills. 1500 w. Gen Elec Rev—Oct., 1913. No. 45587 C.

Switch Design

Recent Developments in High-Voltage Oil Break Switch Design. E. H. Jacobs. Describes changes and improvements introduced. Ills. 2500 w. Gen Elec Rev—June, 1913. No. 42588 C.

Switches

A 6000-Ampere, 750-Volt, Three-Phase Oil Switch. Illustrated description of switchgear developed by Messrs. Ferranti, Ltd. 2000 w. Elect'n, Lond—Nov. 15, 1912. No. 37809 A.

Arcing Phenomena on High-Tension Switches. W. Hoepp. Abstract of an article in *Elektrotechnische Zeit.* Considers particularly direct-current switches, and deduces general principles. 1800 w. Elect'n, Lond—April 11, 1913. No. 41380 A.

Main Switchgear and the Continuity of Supply. B. Mittell. Deals with the importance of constructing main switchgear so that the chance of failure of supply is reduced to a minimum. 4500 w. Elect'n, Lond—April 5, 1913. No. 41225 A.

Types of Disconnecting Switches and Their Application. H. G. French. Gives descriptions of disconnecting switches suitable for use on circuits up to 150000 volts. Ills. 1200 w. Gen Elec Rev—July, 1913. No. 43331 C.

Switching

Switching Operations on Low and High-Tension Systems, with Special Reference to the Safest Methods. W. W. Lewis. Summary of results of investigations of the phenomena occurring when high or low-voltage switching is performed with various interconnections. Gives also recommendations as to the safest methods.

Switching

Wiring

Ils. 1700 w. Gen Elec Rev—Oct, 1913. No. 45585 C.

Three-Wire

The Question of Voltage Distribution in Three-Wire Continuous-Current Networks (Zur Frage der Spannungssteilung in Dreileiter-Gleichstromnetzen). A. Lauteren. A study of the theories involved. Diagrams. 1800 w. Elek u Masch—July 20, 1913. No. 44690 D.

Three Wire System

Three Wire System with Rotary Balancer. A. M. Bennett. Discusses especially the rotary balancer and its action. 2500 w. Power—April 8, 1913. No. 41127.

Wiring

Modern Methods of Electric Wiring. Frank Broadbent. Read before the Assn. of Engrs.-in-Charge. Explains systems and details of methods used. 4500 w. Elec Rev & W Elec'n—Jan. 11, 1913. No. 38978.

Electrical Equipment of the Jersey City Post-Office. Harold A. Alb. Describes the method of wiring, the materials used, and the fixtures installed. Ils. 1800 w. Elec Rev & W Elec'n—Feb. 22, 1913. No. 39992.

Residence Wiring. Illustrated description of an installation in a brick building having concrete floors. 2500 w. Elec Rev & W Elec'n—April 26, 1913. No. 41655.

The Protection of House wiring from High Voltages Caused by the Operation of Nearby Wireless Telegraph Outfits. G. F. Gray. Reports a quantitative study of the disturbances and their removal. Describes a system of protection, using the aluminum cell arrester and the new vacuum tube arrester. 3000 w. Gen Elec Rev—April, 1913. No. 40989 C.

Developments in Electrical Wiring Calculations (Die Entwicklung elektrischer Leitungsrechnungen). Josef Herzog. Progress made in wiring, network, feeder and distribution calculations since 1883. Ils. 4800 w. Elek u Masch (Special)—March, 1913. No. 41490 D.

A Modern Installation of Hospital Wiring. Harold L. Alt. Illustrated description of an interesting installation in the Hospital for the Ruptured and Crippled, in New York City. 1000 w. Elec Rev & W Elec'n—May 24, 1913. No. 42388.

An Interesting Installation of Wiring in an Office Building. Illustrates and describes methods of construction in a

DYNAMOS AND MOTORS

A. C. Motors

modern type of fireproof building. 2500 w. Elec Rev & W Elec'n—May 17, 1913. No. 42225.

Common-Sense Methods of Making Wiring Calculations. N. V. Dunne. Gives examples and solutions. Ils. 4000 w. Elec Rev & W Elec'n—June 14, 1913. No. 42845.

The Electrical Work in a Large Store and Office Building. Illustrated notes on wiring and equipment, details of construction, &c. 3000 w. Elec Rev & W Elec'n—June 7, 1913. No. 42727.

The Electrical Work in the New Medinah Temple. Illustrated notes on the equipment and wiring. 2500 w. Elec Rev & W Elec'n—May 31, 1913. No. 43655.

Some Practical Features of Safe Moulding Wiring. E. B. Munsey. Calls attention to certain features in connection with this work, essential for safety. Ils. 2200 w. Elec Engng—July, 1913. No. 43606.

Wiring Buildings of Steel Construction. Ernest G. Bradshaw. Discusses methods which seem to be standard in some modern plants and which give an excellent installation. Ils. 1200 w. Mech Wld—July 18, 1913. Serial. 1st part. No. 43958 A.

Wiring of the Bankers' Trust Building. Illustrates and describes features of the wiring installation and riser-shaft construction in a 31-story office building. 1800 w. Elec Wld—June 28, 1913. No. 43309.

Electric Wiring and Illumination of the Continental and Commercial Bank Building, Chicago. Illustrated detailed description. 5000 w. Elec Wld—July 26, 1913. No. 43928.

The Development of Rubber-Covered Wire Specifications for House Wiring. Hugh T. Wrecks. Shows the development of National Electrical Code specifications from 1901 to date. 2500 w. Elec Wld—Aug. 23, 1913. No. 44564.

Conduit Wiring. O. N. Casey. Illustrates and describes electrical conduit fittings and methods of supporting cables. 1500 w. Prac Engr—Sept. 1, 1913. No. 44863.

Battery-Room Wiring of Electric-Vehicle Factory. T. W. Poppe. Illustrated description of work in a factory at Long Island City. 2000 w. Elec Wld—Oct. 25, 1913. No. 46204.

See also same heading, under STREET AND ELECTRIC RAILWAYS.

DYNAMOS AND MOTORS

A. C. Motors

Alternating Current Motors for Mines and Mills. S. R. Stone. Explains con-

siderations that should guide in the selection of motors best suited to the purpose intended for use in mines and mills.

Consult Classification of the Index. See page 9.

A. C. Motors.

DYNAMOS AND MOTORS

Alternators

Ills. 4500 w. Min & Engng Wld—Nov. 9, 1912. No. 37344.

Mine Ventilators Driven by Three-Phase Motors with Regular Periods (Antrieb von Grubenventilatoren durch Drehstrommotoren mit regelbarer Umlaufzahl). Herr Sauvage. Describes new Brown, Boveri-Scherbius plant installed in prominent Austrian mines. Ills. 2400 w. Glückauf—Oct. 12, 1912. No. 37410 D.

A. E. G. Three-Phase Motors for Direct Coupling with Hydraulic Turbines (A. E. G.-Drehstrommaschinen für direkte Kuppelung mit Wasserturbinen). G. Lewinnek. Detailed description. Ills. 1200 w. Elek Kraft u Bahnen—Oct. 14, 1912. No. 37467 D.

Useful Braking of Polyphase Commutator Motors with Series Characteristics (Ueber die Nutzbremmung der Mehrphasen-Kommutatormotoren mit Seriencharakteristik). F. Niethammer and E. Siegel. Continuation of a series of articles on the mathematics involved in motor-braking. Ills. 2800 w. Elek u Masch—Sept. 29, 1912. No. 37469 D.

Notes on the Parallel Running of Alternators. L. Fokes. Read before the S. Wales Br. of the Assn. of Min. Elec. Engrs. The discussion is confined to three-phase machines, considering the connections, methods of synchronizing, effects of excitation and of armature reaction, etc. 2500 w. Ir & Coal Trds Rev—Dec. 6, 1912. No. 38256 A.

Large Synchronous Motors for Compressor Service. Girard B. Rosenblatt. General discussion of air compressors for the pressure used in mining work, with illustrated description of the plant of the Anaconda Copper Mining Co., at Butte, Mon. 3000 w. Min & Sci Pr—Dec. 7, 1912. No. 38165.

Alternating-Current Motors for the Economic Operation of Mine Fans. F. B. Crosby. Considers mine fan applications under the heads of those requiring constant speed, and those requiring adjustable speed drive. 3000 w. Pro Am Inst of Elec Engrs—April, 1913. No. 41675 F.

The Kapp Factor for Alternating Currents of General Curve Form (Der Kappsche Faktor für Wechselströme allgemeiner Kurvenform). Leopold Klein. Theoretical discussion based on the statements of Dr. Karl Pichelmayer, in his *Handbuche der Elektrotechnik*. 3200 w. Elek u Masch—March 9, 1913. No. 41477 D.

See also Railway Motors, under *Dynamos and Motors*.

Air-Gaps

Air-Gaps in Moving-Coil Instruments. Charles C. Garrard. 'Considers the effect of various arrangements of the air-gap on the efficiency of the instrument. 1500 W. Elec Rev, Lond—June 27, 1913. No. 43621 A.

Alternators

Notes on the Design of Steam Turbine-Driven Alternators. H. G. Reist. Discusses recent tendencies in the design of high-speed alternators. Ills. 1200 w. Gen Elec Rev—Feb., 1913. No. 39611 C.

Regulation of Definite Pole Alternators. Soren H. Mortensen. Suggests a method called the "triangle method." 900 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40187 F.

The Experimental Determination of the Regulation of Alternators. A. B. Field. Advocates basing regulation determinations upon the power factor zero load saturation, and the no-load saturation. 1500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40208 F.

Parallel Operation of Alternators. C. A. Tupper. Enumerates conditions that must be complied with before two alternators may be placed at work in parallel upon a common load. 1500 w. Coal Age—April 26, 1913. No. 41547.

Alternator Testing. F. S. Barton. Detailed description of tests made. 4000 w. Power—April 22, 1913. No. 41566.

Air Filtration, Cooling and Ventilating of Electrical Machinery. J. Christie. Notes applying to large steam turbo-driven alternators. Ills. Short discussion. 2800 w. Elec Rev, Lond—June 27, 1913. No. 43622 A.

Air Filtration, Cooling and Ventilating of Electrical Machinery. J. Christie. Notes intended to apply to large steam turbo-driven alternators. Ills. Discussion. 3000 w. Elect'n, Lond—June 20, 1913. No. 43376 A.

Proper Installation of Alternators. C. A. Tupper. Enumerates the principal differences in alternators which bear upon the method employed in installation. 2500 w. Coal Age—July 26, 1913. No. 43921.

High Frequency Alternators (Les Alternateurs à haute Fréquence). R. Jouaust. Description of those employed in radiotelegraphy and radiotelephony. Ills. 7200 w. Rev Gen des Sciences—June 30, 1913. No. 43573 D.

On the Goldschmidt Alternator. Thomas R. Lyle. Shows that the theory of the Goldschmidt alternator is a simple case of the more general theory of the alternate-current generator. Math-

Armature Discs

emational. 2500 w. Elect'n, Lond—Sept. 26, 1913. No. 45728 A.

Armature Discs

The Manufacture of Armature and Field-Magnet Discs and Improvements in Machines and Tools Used for This Work (Die Fabrikation von Anker-und Feldmagnetblechen und die Entwicklung der dazu geeigneten Maschinen und Werkzeuge). August Bauschlicher. Describes apparatus in present use. Ills. Serial, 1st part. 2500 w. Zeit für Werkzeuge—July 15, 1913. No. 44672 D.

Armatures

Armature Reaction in Lap-Wound Machines. Dr. W. Lulofs. Shows that only in the case of the four-pole machine is the counterbalancing true. 1800 w. Elect'n, Lond—Nov. 29, 1912. Serial. 1st part. No. 38114 A.

Some Mechanical Points in Armature Construction. R. Livingstone. Notes relating to the estimation of certain values of importance in the mechanical design of generators and motors. 2500 w. Elect'n, Lond—Jan. 24, 1913. Serial, 1st part. No. 39776 A.

The Deflection of Armature Shafts. H. Edington. Mathematical discussion of the problem, describing a convenient method of following the curves. 3500 w. Engng—Jan. 31, 1913. No. 39800 A.

See also Windings, under *Dynamos and Motors*

Brushes

Carbon Brushes for Direct Current Machines. E. H. Martindale. Shows that the brush holder and brush holder rigging are responsible for more trouble than any other one part of the machine. Ills. 1800 w. Elec Trac—June, 1913. No. 42850.

Some Experiments on Brush Contact Resistance. Alfred Hay, M. H. Bhatt, and J. M. Parikh. An account of experiments carried out at the Indian Inst. of Science, Bangalore. 3000 w. Elect'n, Lond—July 4, 1913. No. 43705 A.

Brush Losses

Brush Friction and Contact Losses. H. F. T. Erben and A. H. Freeman. Calls attention to the insufficiency of the present Standardization Rules of the Institute on this subject, and describes a more accurate method. 600 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40193 F.

Methods of Determining Brush Losses Due to Contact and Friction. H. R. Edgecomb and W. A. Dick. Indicates the avenues along which investigations should proceed and the nature of the results which will be useful to designing engineers. Ills. 3300 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40198 F.

DYNAMOS AND MOTORS

Commutation

Commutation and Brush Loss. C. E. Wilson. Discusses the brush loss in d. c. machines and calls attention to the relation between the commutating characteristics of the machines and this loss. 1600 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40212 F.

Coils

Notes on Internal Heating of Stator Coils. R. B. Williamson. Deals with a. c. generators, particularly those with long cores in which little heat can be conducted from the center of the machine to the ends. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40197 F.

Studies on Choking Coils (Studien über Drosselspulen) R. Edler. The derivation of formulæ for the calculation of iron-core choking coils. Ills. Serial. 1st part. 2800 w. Elek u Masch—Sept. 21, 1913. No. 46081 D.

Commutation

The Physical Theory of Commutation. G. W. Worrall. Discusses the self-induction of the short-circuited coil, the magnetic condition of the commutating zone, and some various other commutation theories. 5500 w. Elect'n, Lond—Jan. 17, 1913. No. 39461 A.

Experimental and Theoretical Research on Commutation in Continuous-Current Dynamos (Recherches expérimentales et théoriques sur la commutation dans les dynamos a courant continu). M. Mauduit. A comprehensive review of original work in corroboration and disagreement with theories expressed by others. Ills. 21000 w. Bull Soc Int d'Electriciens—Dec. 1912. No. 39080 F.

The Theory of Commutation. Karl Pichelmayer. Abstract trans. from *Elek. Zeit*. Explains the theory and changes introduced in the formula for calculating the commutation pressure. 2500 w. Elect'n, Lond—Feb. 28, 1913. No. 40469 A.

General Theory of Commutation in the Dynamo (Théorie générale de la commutation dans la dynamo). M. Mauduit. Standards of good commutation by the neutral line theory. Ill. 9800 w. Bull Soc Int d'Electriciens—Feb., 1913. No. 40584 F.

Commutating-Pole Saturation in D-C. Machines. Harold E. Stokes. Discusses the importance of obtaining the characteristic curve of the commutating-pole useful flux, especially in machines designed to withstand heavy overloads. 3500 w. Pro Am Inst of Elec Engrs—July, 1913. No. 43345 F.

The Neutral Commutation Zone (Die neutrale Kommutierungszone). C. L. R. F. Menges. Contribution to the theories

Consult Classification of the Index. See page 9.

Commutators

DYNAMOS AND MOTORS

Control

advanced by Pichelmayer, with original researches. Diagrams. 4000 w. Elek u Masch—June 29, 1913. No. 43544 D.

Commutation in the Actual Neutral Zone (Kommutierung in der wirklich neutralen Zone). M. Latour. Restatement of the author's opinion, and other theories. Ills. 1800 w. Elek u Masch—July 27, 1913. No. 44691 D.

Commutators

The Care and Operation of Commutators. H. S. Page. Discusses how to secure best results. Ills. 3500 w. Gen Elec Rev—May, 1913. No. 41814 C.

Design and Operation of Direct Current Commutating Pole Machines. Frank E. Fisher. Discusses operating principles and brush adjustments. 3500 w. Elec Engng—Sept., 1913. No. 45022.

Some Examples of the Theory of Alternating Current Commutator Motors (Einige Beispiele zur Theorie der Wechselstrom-Kollektormaschinen). Johann Lissner. Mathematical discussion. Ills. Serial, 1st part. 4400 w. Elek u Masch—July 13, 1913. No. 44689 D.

Reverse Current and Useful Braking in Single-Phase A. C. Commutators with Series Characteristics (Zur Gegenstrom- und Nutzbremmung von Einphasen-Wechselstromkommutatormotoren mit Seriencharakteristik). Oskar Srnka. Studies the simple series motor, series motor with interposed brake, repulsion motor, etc. Ills. 5000 w. Elek u Masch—Aug. 17, 1913. No. 44695 D.

Condensers

Energy Losses in Some Condensers Used in High-Frequency Circuits. L. W. Austin. Describes experiments to determine the energy losses in different types of sending condensers. 1600 w. Bul Bureau of Stand—March 15, 1913. No. 42934 N.

Contractor

A Single-Phase Alternate-Current Contractor. E. Wilson, J. G. Winn, C. R. Bicknell, and G. R. Anderson. Describes experiments made on a contractor magnet provided with a short-circuited coil. Ills. 1000 w. Elect'n, Lond—March 28, 1913. No. 41131 A.

Control

The Economical Speed Control of Alternating-Current Motors Driving Rolling Mills. F. W. Meyer and Wilfred Sykes. Reviews some of the arrangements used and suggested to meet the required conditions, from a practical operating and commercial standpoint. 9500 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38509 F.

Control Apparatus for D. C. Motors. George J. Kirchgasser. Illustrated re-

view of general types and their methods of working. 3000 w. So Elect'n—Dec., 1912. No. 38163.

The Electrical Control of Distant Apparatus. Reviews a recent paper by W. Duddell, A. H. Dykes, and H. W. Handcock, presented to the Inst. of Elec. Engrs. Proposes the employment of relays which will only operate when supplied with electric current of a certain character. 3500 w. Engr, Lond—Feb. 21, 1913. No. 40319 A.

Remote and Automatic Control of Small Alternating-Current Motors. George J. Kirchgasser. Drawing and description of switch arrangements. 900 w. Elec Rev & W Elect'n—March 22, 1913. No. 40773.

Advances in Electrical Remote Control (Fortschritte der elektrischen Fernsteuerung). W. Wolf. Studies on the latest control systems. Ills. Serial. 1st part. 2800 w. Schiffbau—Feb. 26, 1913. No. 40554 D.

Starting and Speed Control of Induction Motors. F. C. Aldous. Features are discussed of the squirrel cage induction motor, and the slip-ring induction motor, considering the type most suitable for different conditions. Abstract of paper and discussion at Manchester. 4000 w. Elect'n, Lond—May 16, 1913. No. 42530 A.

Constant Voltage Transmission. H. B. Dwight. Discusses a method of control of transmission lines by means of synchronous motors—the advantages and disadvantages. 4000 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43211 F.

Protective Control of Motors with Automatic Starters (Schützensteuerungen zum selbsttätigen Anlassen von Motoren). H. Cruse. Discusses the subject in relation to a. c. and d. c. circuits. Ills. 3300 w. Zeit des Ver deutscher Ing—May 10, 1913. No. 43012 D.

Phase Compensation. Val. A. Fynn. Reviews the nature of phase difference, its effects, how it is produced, and how it can be controlled in A. C. motors, and how the power-factor of a single-phase motor can be controlled. Ills. 6000 w. Elec Wld—July 5, 1913. Serial. 1st part. No. 43474.

Leonard Patent for Electric Control. Diagrams and description of an interesting invention of H. Ward Leonard, and of some of its applications. 1000 w. Elec Wld—Aug. 16, 1913. No. 44414.

See also Electric Power, under MINING AND METALLURGY, Iron and Steel, and Control, under STREET AND ELECTRIC RAILWAYS. Also Induction Motors, under Dynamos and Motors.

Converters

DYNAMOS AND MOTORS

Heat Transmitters

Converters

Induction Converters (Induktionsumformer). Carl Theodor Buff. Their application as frequency converters in transforming energy from single frequencies to diverging frequencies. Ills. 3300 w. Elek Kraft u Bahnen—March 14, 1913. No. 41500 D.

Rotary Power-Factor Limitations of Converters as Controlled by Tap Coil Heating. J. L. McK. Yardley. Gives curves showing approximately the variations in power-factor which occur, and points out the desirability of adjusting a rotary converter to give 100 per cent power-factor at full load. 1000 w. Elec Jour—Sept., 1913. No. 45105.

Cooling

Air Filter Plants for Electric Generators. Brief illustrated description of a modern type of air-filter plant. 1000 w. Elec Rev, Lond—Sept. 26, 1913. No. 45727 A.

D. C. Machines

The Change of Energy Loss with Speed in Direct-Current Machines. W. M. Thornton. Deals with measurements for the purpose of examining the dependence of loss on speed. Short discussion. 4200 w. Elect'n, Lond—Dec. 20, 1912. No. 38865 A.

Method of Determining Excitation in Continuous-Current Machines (Méthode de détermination de l'excitation des machines à courant continu). M. Brunswick. A summary of practical methods based on theoretic determinations. Ills. 11200 w. Bull Soc Int des Electriciens—Nov., 1912. No. 39062 F.

See Transformers, under *Transmission*.

Design.

A Step of Progress in Motor Manufacture. C. W. Starker. Illustrated description of the principal processes in the manufacture of the direct-current motor known as the "SK" type, as built by the Westinghouse Elec. & Mfg. Co., so far as they show the "pressed steel idea" as applied to motor manufactures. 3000 w. Elec Jour—March, 1913. No. 40868.

Vertical Axis Motors and Generators; Their Construction and Application (Vertikallaxige Motoren und Generatoren, ihre Construction und Verwendung). J. Schmidt. Description of several types. Ills. Serial. 1st part. 1600 w. Elek Rund—April 10, 1913. No. 41476 D.

Dynamoes

See Rotary Machines, under *Machine Elements and Design*.

Experimental Plant

An Experimental Alternating Plant. Describes a small alternating plant installed at the Derby Technical College, and the switchboard for controlling the

machines. 2500 w. Elect'n, Lond—Sept. 5, 1913. No. 45143 A.

Fan Motors

Fan Motors and Their Control. George J. Kirchgasser. Illustrated directions. 10000 w. Power—Dec. 31, 1912. No. 38699.

Flashing

Flashing in Railway Motors. J. A. Reeves. Discusses what is necessary to keep down the flashing. 1000 w. Elec Jour—Oct., 1913. No. 46332.

Generators

Generators for Hydroelectric Plants According to the Siemens-Schuckert Specifications (Generatoren für Wasserkraftanlagen nach Ausführungen der Siemens-Schuckertwerke). Herr Buchta. Illustrated description of recent improved types. Serial. 1st part. 2200 w. Elek Kraft u Bahnen—Oct. 14, 1912. No. 37466 D.

Calculations and Experimental Determination of "Medium Reactance Voltages" (Berechnung und experimentelle Bestimmung der "mittleren Reaktanzspannung"). J. Liska. Studies on the voltages appearing between brush and commutator in D. C. generators. Diagrams. 3200 w. Alek u Masch—Oct. 6, 1912. No. 37472 D.

High Frequency Generator. E. F. W. Alexanderson. Indicates the probable course of development in the wireless art, and illustrates and describes the high-frequency generator for wireless telegraphy and telephony. 3000 w. Sci Am Sup—May 24, 1913. No. 42318.

The Condenser Machine. Describes a new electro-static machine for the direct generation of high-tension continuous current, invented by Dr. H. Wommelsdorf. Ills. 1000 w. Elec Rev, Lond—Aug. 29, 1913. No. 45026 A.

Heat Tests

Short Heat Tests of Electrical Machines. W. R. Cooper. Read before the British Assn. Report of experimental investigations and results. 3800 w. Elect'n, Lond—Sept. 19, 1913. No. 45560 A.

Heat Transmission

Laws of Heat Transmission in Electrical Machinery. Irving Langmuir. Presents the fundamental laws of conduction, radiation and convection of heat, and gives experimental data of value. 7000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40195 F.

The Conduction of Heat: With Results of an Investigation of the Thermal Resistivity of Heat-Insulating Materials. C. P. Randolph. Report of investigations carried out on a wide range of substances.

Consult Classification of the Index. See page 9.

Induction Motors

DYNAMOS AND MOTORS

Inspection

3500 w. Gen Elec Rev—Feb., 1913. No. 39617 C.

Homopolar

Homopolar Dynamos (Les dynamos homopolaires). L. V. Bournat. A general outline of the principles of unipolar dynamos, with historical sketch, followed by descriptions of modern applications. Ills. 7000 w. Tech Mod—April 1, 1913. No. 41520 D.

Hunting

Hunting. Charles P. Steinmetz. Defines and explains the nature of synchronizing power and force, showing that hunting is not a function of the synchronizing force, but is a true hysteresis effect. 1800 w. Gen Elec Rev—May, 1913. No. 41808 C.

Induction Coils

Shortening of the Period of Excitation in Coils Having High Self-Induction (Verkürzung der Erregungszeit von Spulen mit hoher Selbstinduktion). W. Weiler. A mathematical discussion of six methods for producing this result. Diagrams. 2000 w. Elek u Masch—May 25, 1913. No. 43042 D.

Induction Motors

Discussion on "The Squirrel Cage Induction Generator" (Hobart and Knowlton), "Single Phase Induction Motors" (Branson), and "Motor Starting Currents as Affecting Large Transmission Systems" (Lincoln). Boston, Mass., June 28, 1912. 3500 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37900 F.

A New Type of Induction Motor. M. I. Williams-Ellis. Describes the advantages of the "Cascade" single and multi-speed motors. Ills. 8000 w. S African Min Jour—Sept., 1912. (Special.) No. 37858 N.

Notes on the Application of Small Induction Motors. Bernard Lester. Considers their correct application, giving a chart for determining relative characteristics of small induction motors and instructions for its use. Ills. 900 w. Elec Jour—Nov., 1912. No. 37890.

The Single-Phase Induction Motor (Der Einphaseninduktionsmotor). Robert Moser. Presents the two theories and gives detailed studies. Ills. Serial. 1st part. 4800 w. Elek u Masch—Oct. 18, 1912. No. 37473 D.

Simplified Equations for the Induction Motor. S. M. Robinson. Gives a solution believed to be more simple than methods used. 3000 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38298 H.

Induction Motor Details. W. Baxter. Read before the Assn. of Min. Elec. Engrs. A critical examination of some details of the modern induction motor.

Ills. 3500 w. Ir & Coal Trds Rev—March 7, 1913. No. 40636 A.

The Cascade Induction Motor. M. I. Williams-Ellis. Abstract of a paper read before the S. African Inst. of Engrs. Reviews early work on cascade construction and gives a description of the cascade induction motor of the single and multiple-speed type, and its adaptability to mining and general work. 1700 w. Elect'n, Lond—Feb. 21, 1913. No. 40303 A.

Starting and Speed Control of Induction Motors. F. C. Aldous. Abstract of a paper read before the Manchester local section of the Inst. of Elec. Engrs. Considers only 2 and 3-phase motors of the squirrel cage and slip-ring types. 4500 w. Mech Engr—Feb. 28, 1913. No. 40478 A.

A Self-Starting Single Phase Induction Motor. Charles F. Fraasa, Jr. Illustrated directions for its construction. 2000 w. Sci Am Sup—April 12, 1913. Serial. 1st part. No. 41179.

Tests on Induction Motors Designed with Deep Rotor Slots. L. D. Jones. Gives Results of tests made on deep slot rotors in comparison with rotors having slots of normal depth. 1500 w. Gen Elec Rev—April, 1913. No. 40987 C.

On Phase-Advancing. Dr. Gisbert-Kapp. Describes the equipment used for this purpose, especially the machine designed by the author for use with induction motors. Ills. 6800 w. Inst of Elec Engrs—April, 1913. No. 41998 N.

The Application and Care of Induction Motors. C. A. Tupper. Remarks on the adaptability of these machines, with suggestions for their selection. 2000 w. Ir Trd Rev—Aug. 21, 1913. No. 44524.

The Induction Motor. F. A. Annett. Deals with the construction and operation of recent types. Ills. 2500 w. Power—Oct. 14, 1913. Serial. 1st part. No. 45815.

Care of Induction Motors at Mines and Mills. George E. Edwards. Considers the factors influencing the selection and the points needing special attention. Ills. 2500 w. Min & Engng Wld—Oct. 18, 1913. No. 45948.

The New Sandycroft-Hunt Cascade Motors (Neue Kaskaden-Motoren, Bauart Sandycroft-Hunt). A. Ricker. Details of the most recent type. Ills. 2500 w. Zeit des Ver deutscher Ing—Sept. 20, 1913. No. 46042 D.

Inspection

Motor Inspection and Maintenance in Industrial Plants. F. E. Hanchette. Outlines a system of daily inspection showing its value. 1200 w. Eng News—Oct. 16, 1913. No. 45931.

Consult Classification of the Index. See page 9.

Losses

DYNAMOS AND MOTORS

Railway Motors

Losses

Induction Motor Load Losses. Henry G. Reist and A. E. Averett. An account of irregularities, methods of measuring losses, results of tests, and conclusions. 1500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40176 F.

Load Losses of Alternating Current Generators. W. J. Foster and Edgar Knowlton. Considers method of determining such losses, which are relatively small and difficult to determine accurately. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40177 F.

Stray Losses in Induction Motors. A. M. Dudley. Shows the "load losses" on induction motors, as described in Sec. 167 of the Standardization Rules, include some losses not actually present when the motor is running under normal conditions. Suggests a method. 2000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40183 F.

Stray Loss in Direct-Current Commutating Machines. H. F. T. Erben and H. S. Page. Presents data showing the magnitude of stray loss occurring in various types of d.-c. machines, and derives approximately correct formulae for determining this loss. 1000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40186 F.

The Determination of Stray Losses from Input-Output Tests. L. T. Robinson. Discusses the precision that can be expected in determining efficiency of certain types of direct current tests. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40215 F.

Notes on Stray Losses in Synchronous Machines. F. K. Brainard. Shows the error of the Institute Rule of taking "load loss" and recommends that the rule be revised. 700 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40203 F.

Notes on Induction Motor Losses. R. W. Davis. Notes on data obtained from numerous tests. 700 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40192 F.

Determination of Load Loss Correction Factors for Rotating Electric Machines. E. M. Olin and S. L. Henderson. Presents data relating to load losses of certain classes of machines and describes the methods employed to secure the data. Ills. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40202 F.

Machine Foundations.

Sole-Plates and Shoes for Electrical Machine Foundries. F. B. Duggan. Defines the terms and indicates how sole-plates and shoes should be used. Ills. 1200 w. Elec Wld—March 15, 1913. No. 40673.

Mill Motors

Discussion on "Direct-Current and Alternating-Current Mill Motors for Auxiliary Drives," Pittsburgh, Pa., April 25, 1912. The paper by Brent Wiley is discussed. 3000 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37898 F.

Motor Casings

An Investigation of Explosion-Proof Motors. H. H. Clark. Describes the methods of investigation, and discusses the results of tests. Ills. 44 pp. U S Bureau of Mines—Bul. 46. No. 37882 N.

Motor Performance

Performance Similarities of the Direct Current Shunt Motor and the Polyphase Induction Motor. William G. Merowitz. A report of performance tests showing the similarity in the output characteristics of these types. 700 w. Elec Wld—Feb. 1, 1913. No. 39637.

Motors and Motor Applications. A. B. Morrison, Jr. Considers the factors important in fixing the proper size and type of motor, discussing the characteristics of the various types. 3000 w. Power—Feb. 25, 1913. No. 40110.

Commutating Pole Motors. M. Eisig. Read before the Cong. of Int. Tram. & Light Rys. Discusses questions connected with the use of such motors and the advantages thus far established. 3000 w. Tram & Ry Wld—Feb. 6, 1913. No. 40119 B.

Self-Starting Synchronous Motors. Illustrated detailed description of a machine built in Manchester, Eng. 1000 w. Engr, Lond—Jan. 26, 1913. No. 39809 A.

Motor Rating

The Rating of Induction Motors. Alexander Gray. If the rating of induction motors is changed from one with an overload guarantee to a single rating with no overload margin, certain changes will be made in the design of the machines. The article points out these changes. 500 w. Elec Wld—June 28, 1913. No. 43310.

Motor Slip

Stroboscopic Method of Measuring Induction Motor Slip. C. W. Kincaid. Describes this method. 900 w. Elec Jour—July, 1913. No. 43809.

Purchasing

Purchase of Electrical Apparatus. Henry D. Jackson. Suggestions are given concerning details of construction and installation of electrical machines and switchboards. 2000 w. Coal Age—Aug. 30, 1913. No. 44869.

Railway Motors

Single-Phase Railway Motors (Die Bahnmotoren für Einphasenstrom). M. Latour. Results of experiments conducted by the Compagnie des Chemins

Rating

DYNAMOS AND MOTORS

Starting

de fer du Midi. Ills. 4000 w. *Elektrotech u Masch*—Dec. 1, 1912. No. 38466 D.

The Development of the Electric Railway Motor. N. W. Storer. Discusses the present trend in design and methods of securing higher efficiency and greater output. 5500 w. *Elec Ry Jour*—Jan. 4, 1913. No. 38825.

Economies in Railway Motor Maintenance. J. C. Thirlwall. Discusses the importance of regular inspection, the desirability of careful selection and treatment of brushes, overhauling, etc. 4000 w. *Gen Elec Review*—April, 1913. No. 40986 C.

Single-Phase Alternating-Current Commutator Motors for Railways. M. Latour. Abstract of an article in *Elektrotechnik und Maschinenbau*. Various types are compared. 2500 w. *Elect'n, Lond*—March 28, 1913. No. 41130 A.

Notes on the Manufacture of Electric Railway Apparatus. R. L. Wilson. Supplementing an article by C. B. Auel. Discusses points calling for consideration in the manufacture of railway apparatus. Ills. 3000 w. *Elec Jour*—Oct., 1913. No. 46331.

Some Features in Motor Design for Low Floor Cars. F. W. McCloskey. Explains some of the difficulties which have been met in the design of motors for low-floor cars. 2500 w. *Elec Jour*—Oct., 1913. No. 46329.

Rating.

Generator and Prime Mover Capacities. David B. Rushmore and Eric A. Lof. The importance of the proper adaptation of the capacities is discussed. Considers it desirable to give all generators a maximum constant continuous rating at a specified temperature. 2000 w. *Pro Am Inst of Elec Engrs*—March, 1913. No. 40441 F.

Reactance

Synchronous and Asynchronous Reactance. J. Rezelman. Describes experiments carried out on a turbo-alternator having a solid cylindrical, steel rotor. Ills. 1200 w. *Elect'n, Lond*—Sept. 12, 1913. No. 45288 A.

Regulators

Automatic Pressure Regulators. R. L. Morrison. Gives brief descriptions of the Tirrill, Westinghouse, Taylor-Scotson, Thury and Brown-Boveri regulators. Ills. 3000 w. *Elect'n, Lond*—Aug. 22, 1913. Serial, 1st part. No. 44905 A.

Pressure Regulation. C. Turnbull. A discussion of regulating gear. Diagrams. 2500 w. *Elec Rev, Lond*—Sept. 5, 1913. No. 45141 A.

Reversing Motors

The Application of Direct Connected

Reversing Motors to Planers, Slotters, and Other Machine Tools. Charles Fair. Shows the large increase in production and saving in power consumption with this form of drive. Ills. 3000 w. *Gen Elec Rev*—Feb., 1913. No. 39612 C.

Series-Wound

The Series-Wound Electric Motor Working at Constant Pressure and with Constant Current. Sydney F. Walker. Shows the difference in the working of the two machines under the different conditions. 4000 w. *Col Guard*—May 23, 1913. No. 42754 A.

Shafts

Influence of Magnetic Attraction on the Critical Speed of Dynamo Shafts (Influence de l'attraction magnétique sur la vitesse critique des arbres de dynamos). L. Bergeron. A series of calculations studying the effects of this attraction. Diagrams. 4800 w. *Tech Mod*—May 1, 1913. No. 42175 D.

Single-Phase

A Single-Phase Motor with Pole-Changing Windings. J. S. Nicholson and B. Parker Haigh. Describes a new type of single-phase commutator motor, discussing the principles involved in the use of pole-changing windings. Ills. 8000 w. *Inst of Elec Engrs*—Dec. 12, 1912. No. 38843 N.

Single-Phase Railway Motors. Louis Bell. Gives principles of some common types of single-phase traction motors and a comparison of rectifier systems. 3000 w. *Elec Ry Jour*—June 7, 1913. No. 42719.

Small Motors

Duties Performed by the Small Motor. George J. Kirchgasser. Illustrates and describes a number of applications. 800 w. *Elec Wld*—Dec. 28, 1912. No. 38695.

Sparking

Sparking. E. F. Butler. Remarks on operating faults applying only to machines fitted with carbon brushes. 1000 w. *Power*—June 10, 1913. No. 42734.

Sparking and Commutation. William C. Thorne. Discusses some difficulties in the operation of d. c. generators and motors, giving suggestions for overcoming them. Ills. 1800 w. *Prac Engr, Chicago*—Oct. 1 1913. Serial. 1st part. No. 45577.

Speed Control

Speed Control of Fans and Blowers. W. E. Thau. Explains different methods of control giving comparative costs. 700 w. *Elec Jour*—Nov., 1912. No. 37888.

Starting

Direct-Current Dynamo and Motor Troubles. On difficulties encountered in

Switches

starting first-run on machines of this type. Diagrams. 1500 w. *Elec Rev & W Elect'n*—Oct. 4, 1913. No. 45680.

Switches

150,000-Volt Air-Break Switches for Southern Sierras Transmission System. Illustrated description of switches used by the Southern Sierras Power Co. on the longest direct transmission line, operated at the highest voltage in commercial use. 1500 w. *Elec Wld*—Aug. 2, 1913. No. 44148.

Synchronizing

Operation of Frequency Changers. N. E. Funk. Aims to analyze the fundamental theory underlying the parallel operation of frequency changers, to consider the running conditions, to apply the theory to the operating conditions, and to develop formulæ. 5000 w. *Pro Am Inst of Elec Engrs*—July, 1913. No. 43342 F.

Synchronous Converters

Recent Designs of Synchronous Converters. J. L. Burnham. Points out some of the interesting features in recent designs. Ills. 1500 w. *Gen Elec Rev*—May, 1913. No. 41811 C.

Synchronous Motors

Self-Synchronizing Machines. Dr. E. Rosenberg. Abstract of paper read before the Inst. of Elec. Engrs. Considers the scope of the synchronous motor, self-starting synchronous motors, rotary converters, and methods of synchronizing. 3500 w. *Elect'n, Lond*—April 11, 1913. No. 41378 A.

The Behavior of Synchronous Motors During Starting. F. D. Newbury. Presents experimental data, mainly in the form of oscillograms, showing the effect on field current and armature current of the various conditions of starting. Ills. 4500 w. *Pro Am Inst of Elec Engrs*—June, 1913. No. 43206 F.

The Industrial Use of Synchronous Motors by Central Stations. John C. Parker. Points out applications that may be made, and the means of adapting the apparatus to the conditions. Ills. 2000 w. *Pro Am Inst of Elec Engrs*—June, 1913. No. 43205 F.

The Industrial Use of Synchronous Motors by Central Stations. John C. Parker. Points out applications that may be made of the synchronous motor, and the means of securing coöperative effort between the central station and customers. Ills. 2000 w. *Sci Am Sup*—Sept. 6, 1913. No. 45020.

Some New Switchgear. Illustrates and describes recently introduced switches claiming marked advantages. 700 w. *Engr, Lond*—Aug. 22, 1913. No. 44931 A.

Three-Phase

Speed Control of Three-Phase Motors.

DYNAMOS AND MOTORS

Sidney A. Simon. Read before the W. of Scotland Branch of the Assn. of Min. Elec Engrs. Illustrates and describes the most important methods of three-phase speed control developed. 5000 w. *Ir & Coal Trds Rev*—Dec. 27, 1912. No. 38907 A.

Three Wire

Three-Wire Generators *versus* Rotary Balancers. Alan M. Bennett. Gives an outline of the principles of operation of three-wire systems employed in present-day practice, and by comparison shows the advantages and disadvantages of each. 3000 w. *Elec Rev & W Elect'n*—Aug. 2, 1913. No. 44140.

See also same heading, under *Distribution*.

Troubles

Dynamo and Motor Troubles. R. L. Mossman. Explains some of the troubles in the operation of dynamos and motors, giving causes and remedies. Ills. 2200 w. *Power*—April 15, 1913. No. 41208.

Turbo-Alternators

High Speed Turbo-Alternators—Designs and Limitations. B. G. Lamme. Discusses the design of turbo-alternators with reference to the limitations imposed by very high rotative speeds and large capacities. Ills. 15500 w. *Pro Am Inst of Elec Engrs*—Jan., 1913. No. 39359 F.

High Speed Turbo-Alternators. B. G. Lamme. Discusses their design and limitations. 5700 w. *Elec Jour*—Feb., 1913. No. 40152.

Discussion on "High Speed Turbo-Alternators — Designs and Limitations" (Lamme), New York, Jan. 10, 1913. Ills. 13800 w. *Pro Am Inst of Elec Engrs*—April, 1913. No. 41674 F.

10,000 and 20,000 Horsepower Turbo-Alternators for the Société d'Electricité de Paris a Saint-Denis (Les groupes turbo-alternateurs de 10,000 et de 20,000 chevaux de la Société d'Electricité de Paris a Saint-Denis). V. Sylvestre. Description and installation. Ills. 4000 w. *Tech Mod*—June 15, 1913. No. 43074 D.

25000-Kilowatt Parsons Turbo-Alternator. Illustrated description of this large turbo-alternator for the Commonwealth Edison Co. of Chicago with remarks on the steady advance in size of separate units and the improved economy of turbo-electric machinery. 8000 w. *Engng*—Oct. 17 1913. No. 46243 A.

Turbo-Converter

A Turbo-Converter: A High-Speed Direct-Current Generating Unit. F. Creedy. Describes a new method devised to avoid the difficulty of collecting current from the commutator of a turbo-generator.

Consult Classification of the Index. See page 9.

Turbo-Generators

Ills. 2000 w. Elect'n, Lond—Nov. 8, 1912. No. 37633 A.

Turbo-Generators

Discussion on "Operating Characteristics of Large Turbo-Generators" (Field), and "The Transient Reactions of Alternators" (Durgin and Whitehead), Boston, June 28, 1912. 4500 w. Pro Am Inst of Elec Engrs—Jan., 1913. No. 39364 F.

Arrangement of Exhaust Turbo-Generators. Dr. E. Rosenberg. Illustrates and describes the arrangement of turbo-generator plant at the Summer Lane station, Birmingham, Eng. 2500 w. Engr, Lond—Jan. 10, 1913. No. 39270 A.

Direct-Current Geared Turbo-Generator Set at Cleveland, Ohio. Illustrated description of the largest direct-current turbo-generator set yet constructed. 600 w. Engng—Jan. 31, 1913. No. 39804 A.

Direct-Current Turbo-Generator with Reduction Gears for Railway Service. Illustrates and describes two types of reduction gears, with examples of installations. 2200 w. Elec Ry Jour—Feb. 22, 1913. No. 39989.

The Fire Hazard in Turbo-Generators. G. S. Lawler. Discusses the causes of the increased hazard, and the importance of employing some efficient method of reducing the fire hazard. 1200 w. Jour

ELECTRO-CHEMISTRY**Corrosion**

Am Soc of Mech Engrs—July, 1913. No. 44025 D.

Voltage Regulation

The Appearance and Control of Excess Voltage in Electrical Plants (Auftreten und Bekämpfung von Überspannungen in elektrischen Anlagen). W. Kummer. Mathematical discussion. Serial. 1st part. 2800 w. Schweiz Bau—June 21, 1913. No. 43523 D.

Windings

Recent Designs of Power Limiting Reactances. Eugene D. Eby. Deals with the physical construction of the apparatus, such as method of winding, bracing, spacing, and supporting, and the structure of the core. Ills. 1500 w. Gen Elec Rev—Dec., 1912. No. 37998 C.

The Amortisseur Winding. M. C. Smith. Describes the construction of an actual amortisseur winding built into the field of a synchronous motor, and explains its theory. Discusses its advantages. Ills. 3000 w. Gen Elec Rev—April, 1913. No. 40988 C.

Researches on Air-Gap Ampere Windings (Ermittlung der Luftspalt-Amperewindungen). F. Niethammer. Mathematical discussion with diagrams. 1600 w. Elek u Masch—May 4, 1913. No. 43038 D.

ELECTRO-CHEMISTRY**Albumen**

A Brief Examination of the Electrical Properties of Egg-White. E. F. Northrup. Gives results of investigation. 1600 w. Jour Fr Inst—April, 1913. No. 41285 D.

Cells

A Spontaneous Electromotive Force in Cells of Alkali Metals. Jay W. Woodrow. Abstract of an article in the *Phys. Rev.* Reports an investigation of phenomena described. 1000 w. Elect'n, Lond—Nov. 15, 1912. No. 37810 A.

The Billiter Alkali-Chlorine Cells. Reviews a paper by Dr. A. J. Allmand dealing with these cells. 1400 w. Engng—Dec. 6, 1912. No. 38248 A.

The Billiter Alkali-Chlorine Cells. A. J. Allmand. Abstract of paper read before the Faraday Soc. Deals particularly with the Billiter membrane cell. 2500 w. Elect'n, Lond—Dec. 20, 1912. No. 38866 A.

Two-Solvent Concentration Cells. Discusses the concentration cells with which A. P. Laurie recently dealt in a lecture before the Faraday Society. 1500 w. Engng—Jan. 10, 1913. No. 39261 A.

New Electrolytic Alkali Cell. John B. C. Kershaw. Illustrates and describes a

new cell and process, stating the advantages claimed. 800 w. Sci Am—Aug. 16, 1913. No. 44354.

The Billiter-Siemens Electrolytic Alkali Cell and Process. John B. C. Kershaw. Describes the cell and cell process, and two plants employing the process. Ills. 3000 w. Elec Rev. Lond—Aug. 15, 1913. No. 44709 A.

Electricity Direct from Coal. Emil Baur. Discusses the problem of constructing a galvanic cell with carbon consumption. Ills. 3000 w. Sci Am Sup—May 31, 1913. No. 42553.

Manufacturing G. V. Storage Batteries. Illustrated description of methods used to make storage batteries for electric trucks. 900 w. Am Mach—Dec. 26, 1912. No. 38545.

See also Accumulators. under *Generating Stations*.

Corrosion

The Rusting of the Iron Superstructure in the Simplon Tunnel. A. Danzer-Ischer. Reports investigations made, the causes of the wear and tear and of the rusting phenomena, and conditions in other tunnels. Ills. 7200 w. Bul Int Ry Cong—Nov., 1912. No. 37710 G.

Consult Classification of the Index. See page 9.

Corrosion

ELECTRO-CHEMISTRY

Developments

Electrolytic Corrosion of Iron. Matthew C. Coates. Reports comparative results of tests on corrosion of commercial, steel, wrought iron, ingot iron and cast iron pipes, when subjected to damp soil, with and without applied electric current, and conclusions. 2500 w. Aust Min Stand—Dec. 5, 1912. No. 38858 B.

Contributions to the History of Corrosion. Arnold Philip. Read before the Inst. of Metals. Discusses the corrosion of distilling condenser tubes. 2500 w. Engng—March 14, 1913. No. 40829 A.

Electrolysis from Stray Electric Currents. Albert F. Gans. Explains the theory of electrolytic conduction and considers the sources of electric currents, the effects, damage and design, remedial measures, etc. Ills. 14000 w. Stevens Ind—Oct., 1912. No. 38219 D.

Electrolysis from Stray Electric Currents. Albert F. Gans. Gives an explanation of the theory of electrolytic conduction, and considers the sources and effects of stray electric currents, electrolysis surveys, etc. 7500 w. Am Gas Lgt Jour—March 10, 1913. Serial. 1st part. No. 40669.

The Corrosion of Aluminium. G. H. Bailey. Read before the Inst. of Metals. Discusses the corrosion of aluminium by water and by solutions of common salt, giving results of investigations. 2000 w. Engng—March 14, 1913. No. 40828 A.

Iron Rust, Its Causes and Its Prevention Through Painting (Das Rosten des Eisens, seine Ursachen und seine Verhütung durch Anstriche). Georg Pfeiderer. A study of rust prevention. 4200 w. Zeit des Ver deutscher Ing—Feb. 8, 1913. No. 40537 D.

Stray Railway Currents and the Electrolysis of Metallic Structures (Le correnti vaganti tramviarie e la corrosione elettrolitica delle strutture metalliche). Guido Peri. Production of stray currents from electric conduits and studies on their effects. Ills. Serial. 1st part. 2100 w. Industria—Feb. 9, 1913. No. 40613 D.

Electrolysis from Stray Electric Currents. Read before the New England Assn. of Gas Engrs. Explains the theory of electrolysis, the sources of stray electric currents, general effects on underground piping, etc. Ills. 4500 w. Can Engr—April 3, 1913. Serial. 1st part. No. 41099.

Copper in Steel—Its Influence on Corrosion. D. M. Buck. Read before the Am. Chem. Soc. Gives results of a series of tests, which show that a small copper content increases the life of sheets. Ills. 2200 w. Ir Age—April 17, 1913. No. 41272 C.

An Electrolytic Theory of the Corrosion of Iron. Bertram Lambert. Read before the Faraday Soc. Aims to show that a natural development of the ideas of Faraday on electrolysis will give the beginnings of a satisfactory theory of the corrosion of iron. 4000 w. Met & Chem Engng—May, 1913. No. 41903 C.

The Corrosion of Lead. Richard H. Gaines. Discusses the effects of acids and alkalis with particular reference to lead-lined pipe. 3000 w. Eng Rec—June 21, 1913. No. 43109.

The Corrosion of Cast-Iron Reviewed. Richard H. Gaines. Considers its nature and causes and the practice to secure resistance to destruction. 2500 w. Ir Age—June 5, 1913. No. 42659 C.

Electrolytic Corrosion of Iron in Soils. Burton McCollum and H. K. Logan. Deals with the fundamental laws governing electrolytic corrosion of iron in soils, giving experimental data showing the effect of different factors, and a number of conclusions. 58 pp. Pro Am Inst of Elec Engrs—July, 1913. No. 43341 F.

The Effect of Various Substances on the Rate of Corrosion of Iron by Sulphuric Acid. O. P. Watts. Read before the Am. Elec. Chem. Soc. Considers the effect of various metals deposited on iron. 3000 w. Elec'n. Lond—July 11, 1913. No. 43893 A.

An Electrolytic Method of Preventing Corrosion of Iron and Steel. J. K. Clement and L. V. Walker. An account of experiments made to develop an electrolytic method for preventing corrosion. 4000 w. U. S. Bureau of Mines—Tech Paper 15. No. 44486 N.

The Corrosion of Condenser Tubes. Guy D. Bengough and Richard M. Jones. Second report to the Corrosion Committee of the Inst. of Metals. Gives experiments and discusses results. 6000 w. Mech Engr—Aug. 29, 1913. Serial, 1st part. No. 45035 A.

See also Refrigeration, under MECHANICAL ENGINEERING, *Heating and Cooling*; also Corrosion under MINING and METALLURGY, *Iron and Steel*, and Boilers, under MECHANICAL ENGINEERING, *Steam Engineering*.

Cyanamid

Manufacture and Uses of Cyanamid. E. J. Pranke. Describes its preparation; its use as a fertilizer, and other uses. 2200 w. Chem Engr—March, 1913. No. 40926 C.

Developments

The Present Status of the Electro-Chemical Industry (Der gegenwärtige Stand der elektrochemischen Industrie). Heinrich Paweck. An outline of the pres-

Electric Furnaces

ent investigations along electro-chemical lines. 8800 w. *Elek u Masch (Special)*—March, 1913. No. 41495 D.

Electric Furnaces

Electric Furnace Methods of Steel Production. John B. C. Kershaw. Outlines and gives details of Heroult furnaces at South Chicago and Worcester, Mass. 5500 w. *Ir Trd Rev*—Nov. 7, 1912. Serial. 1st part. No. 37322.

Induction Furnaces and their Relation to the Steel Industry. Joh. Hården. Considers the application to the production of high-grade steel, and gives details of construction of induction furnaces and the way found necessary to make the furnace linings. Ills. 6000 w. *Elect'n, Lond*—Dec. 13, 1912 (Special.) No. 38851 D.

Induction Furnaces for Steel Refining. John B. C. Kershaw. The Kjellin and Röchling-Rodenhauser types are discussed in the present number. 2000 w. *Engr, Lond*—Dec. 20, 1912. Serial, 1st part. No. 38894 A.

Electric Furnaces in the Manufacture of Steel. Edward F. Law. A general account of types available, discussing their characteristics and limitations. 3000 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38850 D.

The Electric Arc Furnace in Steel Production. W. S. Gifford. Illustrates and describes details of the arc type of furnace as developed by Dr. Heroult. 2500 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38852 D.

The Electric Furnace in the Production of Iron from Ore. D. A. Lyon. A critical discussion of the present status and a comparison of the Scandinavian and California practices. Ills. 4500 w. *Met. & Chem. Engng*—Jan., 1913. No. 38969 C.

Electric Furnace for Making Steel for Castings. C. H. Von Baur. Illustrated description of the first Roehling-Rodenhauser furnace installation in the United States, at Lansdowne, Pa. 3000 w. *Ir Trd Rev*—Jan. 9, 1913. No. 38920.

Electric Crucible Furnace for Refining Steel. Illustrates and describes the principal features. 1500 w. *Ir Trd Rev*—Feb. 13, 1913. No. 39844.

Heat Losses in Furnaces. F. A. J. Fitzgerald. The importance of preventing losses of heat, particularly in electric furnaces, is discussed, and attention is called to points in furnace design. 1200 w. *Bul Am Inst of Min Engrs*—March, 1913. No. 40890 F.

Electric Hardening Furnaces. M. Unger. Illustrated description of these furnaces and their operation. 2500 w. *Gen Elec Rev*—March, 1913. No. 40246 C.

The Electric Refining Furnace for Cast

ELECTRO-CHEMISTRY

Electric Furnaces

Steel. J. H. Stansbie. Abstract of a paper before the Birmingham branch of the British Found. Assn. Describes principal types of electric furnaces, discussing their operation. 2200 w. *Foundry*—March, 1913. No. 40285.

Advantages of Small High Speed Electric Furnaces. Carl Hering. Analyzes and discusses the effect of rate of melting and the number of charges on the energy required, illustrating by estimated quantitative data. 4500 w. *Met & Chem Engng*—April, 1913. No. 41043 C.

Some Notes on the Electric Vacuum Furnace. Illustrates and describes furnaces forming a part of the equipment of the research laboratory of the General Electric Co. 1100 w. *Brass Wld*—May, 1913. No. 42427.

Notes on the Kjellin Electric Furnace in Steel Manufacture (Note sul forno elettrico Kjellin per la fabbricazione dell'acciaio). Giacomo Bianchetti. Explanation of the furnace, and details of its operation. Ills. 2200 w. *Industria*—May 4, 1913. No. 42503 D.

Helfenstein Large Electric Furnaces (Grosse elektrische Oefen, Bauart Helfenstein). Max Oesterreich. Illustrated description of the several types erected. 2800 w. *Stahl u Eisen*—Feb. 20, 1913. No. 40506 D.

The Helfenstein Large Electric Furnaces. Illustrates and describes recent developments in the production of ferro-silicon and calcium carbide and in the smelting of Swedish iron ores. 1800 w. *Ir Age*—June 19, 1913. No. 42938 C.

New Steel Foundries Using Electric Furnaces. Oliver J. Abell. Interesting data concerning new types and costs. Ills. 1000 w. *Ir Age*—May 29, 1913. No. 42556 C.

An Electric Furnace for Experiments in Vacuo at Temperatures Up to 1500° C. R. E. Slade. Abstract from *Pro of Roy Soc*. Illustrated description. 1200 w. *Elect'n, Lond*—June 27, 1913. No. 43623 A.

Some Recent Improvements in the Use of the Electric Furnace. Brief account of novel uses for the electric current in industry. Ills. 2200 w. *Sci Am*—Aug. 2, 1913. No. 44071.

Electric Furnaces, Their Design, Characteristics and Commercial Application. Woolsey McA. Johnson and George N. Sieger. Aims to give concisely the scientific engineering and commercial principles and facts involved in the industrial utilization of electric furnaces. 3500 w. *Met & Chem Engng*—Sept., 1913. No. 44971 C.

The Electric Blast-Furnace (Le Haut-

Consult Classification of the Index. See page 9.

Electrochemical Society

fourneau électrique). Paul Nicou. A study of the Domnarfret, Trollhättan, Hagfors, Hardanger, Hérault and Tinfos types. Ills. Serial, 1st part. 6000 w. Tech Mod—Aug. 15, 1913. No. 45338 D.

See also **Electrometallurgy**, under **MINING AND METALLURGY, Iron and Steel**, and **Electric Furnaces**, under **MINING AND METALLURGY, Lead and Zinc**.

Electrochemical Society

American Electrochemical Society Papers at the International Congress. Abstracts of three papers. 3000 w. Met & Chem Engng—Nov., 1912. No. 37254 C.

Electrodes

The Manufacture of Carbon Electrodes for Electro-Metallurgical Purposes (Die Herstellung der Kohlelektroden für elektrometallurgische Zwecke). Illustrated description of practice at several plants. 4200 w. Stahl u Eisen—Nov. 7, 1912. No. 38402 D.

Electrode Suspension in Electric Furnaces (Die Elektrodenfassungen bei Elektroöfen). Discussion on the two general methods of suspension; by cables, and clamps, and methods of replacement. Ills. Serial. 1st part. 2500 w. Stahl u Eisen—March 20, 1913. No. 41407 D.

Electrodes for Electric Furnaces. G. Basil Barham. Discusses electrodes and their manufacture and related matters. 1200 w. Elec Rev, Lond—April 18, 1913. No. 41750 A.

Carbon Electrodes for Electrolytic Cells. John Hårdén. Information concerning "electrolytic carbons," and the testing of the electrodes for electrolysis. 3500 w. Met & Chem Engng—May, 1913. No. 41899 C.

Electrode Holder Construction for Electric Furnaces. Illustrates and describes the principal types of electrode holders for furnaces, with additional notes on joining and dimensioning electrodes. 4000 w. Met & Chem Engng—June, 1913. No. 42605 C.

Carbon Electrodes for Electrolytic Cells. Joh. Hårdén. Discusses the respective merits of amorphous and graphitized carbons and describes the tests that should be applied to determine the quality of carbons. 4000 w. Elect'n, Lond—July 11, 1913. No. 43894 A.

Electrolysis

Effect of Electric Current on Concrete. Abstract of a paper by Dr. E. B. Rosa, Burton McCollum, and O. S. Peters. Also editorial. Points out possible dangers from electrolysis, discussing the cause and best method of mitigating the trouble. 2500 w. Elec Wld—Dec. 28, 1912. No. 38692.

Electrolysis in Fluid Sulphur-Dioxide

ELECTRO-CHEMISTRY.

(Elektrolyse in verflüssigtem Schwefeldioxyd). L. S. Bagster and B. Steele. A study of the action in various solutions containing sulphur dioxide. Ills. Serial, 1st part. 3000 w. Elektrochem Zeit—Dec., 1912. No. 39056 D.

Report of the Committee on Electrolysis. Abstract of report to the Am. Elec. Ry. Assn. Gives results of tests and discusses factors affecting corrosion. 3500 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45927.

Electrometallurgy

Electric Melting of Copper and Brass. C. A. Hansen. A summary of theoretical requirements, results obtained in furnaces of the Rockwell, Charlier and Schwartz types, and in a few experiments with an electric furnace. Ills. 3500 w. Am Inst of Metals—Sept., 1912. No. 43288 N.

The Electric Furnace for Brass Melting. G. H. Clamer and Carl Hering. A general discussion of the factors involved, with available data. 4000 w. Am Inst of Metals—Sept., 1912. No. 43286 N.

The Crystallizing Properties of Electro-Deposited Iron. Dr. J. E. Stead and Prof. H. C. H. Carpenter. Read before the Iron & Steel Inst. (abstract). Describes and explains results of a number of experiments. Ills. 6000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45197 A.

The Smelting of Tin Ore in the Electric Furnace. Abstract translation from *La Revista Minera y Met. de Madrid*. Shows that the electric process can be advantageously employed in places where the ores are good, but not very rich, and whose waterfalls can be utilized. 1500 w. Min Jour—Oct. 18, 1913. No. 46228 A.

See also **Electric Furnaces**, under **MINING AND METALLURGY, Iron and Steel**, and **Electric Furnaces**; under **MINING AND METALLURGY, Lead and Zinc**.

Electroplating

Electro-Deposition of Metals and Alloys. From a paper by George P. Lee, in the *Trans. of the Inst. of Marine Engrs*. Concerning the invention of the Italian electrochemists, Messrs. Marino. 2500 w. Ir & Coal Trds Rev—Nov. 8, 1912. No. 37655 A.

Equipment and Management of Nickel Baths. Seymour W. Rowsbar. Detailed directions. 1800 w. Foundry—Dec., 1912. Serial. 1st part. No. 37990.

The Rapid and Accurate Estimation of Silver in Silver Plating Solutions. Explains a method based on the insolubility of silver sulphide in a dilute potassium cyanide solution. 2200 w. Brass Wld—Jan., 1913. No. 39345.

Consult Classification of the Index. See page 9.

Electroplating

The Electrodeposition of Platinum. Gives a solution, first used by Roseleur, which gives excellent results. 1200 w. Brass Wld—Feb., 1913. No. 40148.

Application of Chemistry in the Plating Room. E. P. Later. Describes the apparatus and solutions required, with practical suggestions. 2200 w. Foundry—March, 1913. Serial. 1st part. No. 40286.

Equipment and Management of Cleaning Baths. Seymour W. Rowsbar. The cause of rust-covered corroded spots and the remedy. 2500 w. Foundry—May, 1913. No. 41853.

The Electrodeposition of Brass and Bronze. C. W. Bennett. Read before the Am. Elec.-Chem. Soc. Gives recommended solutions and information. 1500 w. Chem Engr—April, 1913. No. 41824 C.

The Estimation of the Free Cyanide in Brass Plating Solutions. Describes a method of maintaining the solution so that the same color can constantly be obtained on the deposit. Ills. 2200 w. Brass Wld—May, 1913. No. 42426.

Re-Plating Old Silver-Plated Flat-Wear. Discusses this class of work, its cost, methods and troubles. 2000 w. Brass Wld—June, 1913. No. 42946.

Preventing "Spotting-Out" of Plated Work by Means of Hot-Water. Explains the causes of spotting and the method of using the hot water. 800 w. Brass Wld—July, 1913. No. 43741.

Notes on the Electro-Deposition of Nickel. Woolsey McA. Johnson. Discusses hot and cold solutions, and why nickel deposited at high current density will not "curl up." 1200 w. Brass Wld—Aug., 1913. No. 44509.

Electroplating at a Typewriter Works. James Stedman. Illustrates and describes details of copper and nickel-plating equipment at the works of the Underwood Typewriting Machine, Hartford, Conn. 3000 w. Ir Age—Sept. 25, 1913. No. 45439 C.

Spotting-Out and Silver Plating. C. F. Burgess and L. T. Richardson. Gives information obtained in a study of this phenomenon. 3500 w. Am Inst of Metals—Oct., 1913. No. 46281 N.

Etching

The Electrolytic Etching of Brass. Illustrates and discusses the method employed. 2700 w. Brass Wld—Feb., 1913. No. 40147.

Hydrogen

The Production of Hydrogen Through Very Low Temperatures by the Linde, Frank and Caro Process. (La fabrication de l'hydrogène au moyen des très basses températures par le procédé Linde,

ELECTRO-CHEMISTRY**Oxygen**

Frank et Caro.) Henri Brot. A general description of the process. Ills. 4000 w. Genie Civil—June 28, 1913. No. 43577 D.

Industrial Chemistry

The Latest Achievement and Problems of the Chemical Industry. Carl Duisberg. Lecture before the Int. Cong. of Ap. Chem. A general review. 8500 w. Chem Engr—Dec., 1912. No. 38817 C.

Nitrogen

Oxidation of Atmospheric Nitrogen and Development of Resulting Industries in Norway. Samuel Eyde. From a lecture delivered in New York City. Describes methods used in the manufacture of nitrate of lime, nitrate of soda, nitric acid and nitrate of ammonia. 3000 w. Chem Engr—Nov., 1912. No. 37919 C.

The Utilization of the Nitrogen of the Air. Arthur A. Noyes. Explains the enormous quantities of nitrogen compounds used as fertilizers and in other industries, and discusses the present and prospective sources of supply, especially the fixation of atmospheric nitrogen. 2500 w. Pop Sci M—March, 1913. No. 40428 C.

The Ostwald Process for Making Nitric Acid from Ammonia. Describes the plant for carrying out the process on a commercial scale, giving running expenses and profits. 3500 w. Ir & Coal Trds Rev—May 23, 1913. No. 42760 A.

The Fixation of Atmospheric Nitrogen. P. H. S. Kempton. Considers fixation with oxygen, fixation with hydrogen, and fixation with carbon. 1700 w. Elec Rev, Lond—April 4, 1913. No. 41221 A.

The Problem of the Commercial Fixation of Nitrogen (Le problème de la fixation industrielle de l'azote). Camille Matignon. General description of the various processes employed, including sodium nitrate, and electrical. 10200 w. Bull Soc d'Encour—June, 1913. No. 43571 E. + F.

Low Temperatures in the Fixation of Nitrogen (Le rôle des basses températures dans l'industrie de la fixation de l'azote). Georges Claude. The necessity and maintenance of low temperatures and description of the Claude apparatus. Ills. 6400 w. Mem Soc Ing Civ de France—May, 1913. No. 43553 G.

Nitrogen and the Electric Furnace. H. G. A. Stedman. From an address delivered in Middlesborough. Discusses features connected with the development of electricity for producing certain valuable compounds of nitrogen. 5000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45198 A.

Oxygen

The Production of Oxygen by the Linde

Atoms

and Claude Processes. Brief review of processes for the production of oxygen, with detailed description of the two processes named, and matters related. Ills. & Plate. 3500 w. Engr, Lond—April 4, 1913. Serial. 1st part. No. 41243 A.

ELECTRO-PHYSICS

Dielectrics

Ozone

Nature, Production, and Uses of Ozone. W. H. Thompson. Considers the characteristics of ozone, methods of production, physiological action, and commercial uses. 4500 w. Elec Jour—Nov., 1912. No. 37884.

ELECTRO-PHYSICS

Atoms.

Photography of Particles Ejected from Atoms. Reviews a discourse by C. T. R. Wilson delivered at the Royal Inst. Illustrations and explanation of the experiments described. 2500 w. Engng—March 14, 1913. No. 40826 A.

The Structure of the Atom. Brief abstract of lectures by Sir J. J. Thomson, dealing particularly with the electrical features. 2000 w. Elect'n, Lond—March 21, 1913. Serial. 1st part. No. 41002 A.

The Structure of the Atom. R. A. Millikan. Describes the experiment by means of which the author succeeded in proving the atomic nature of electricity, and discusses the probable nature of energy radiation. 6000 w. Gen Elec Rev—July, 1913. No. 43326 C.

The Valve Action of Zirconium Anodes. L. H. Walter. Shows that zirconium exhibits a pronounced valve effect. 1000 w. Elect'n, Lond—Oct. 3, 1913. No. 45842 A.

Condensers

An Electrolytic Condenser and Its Application to a Sparkless Type of Contact-Breaker. Dr. K. Siegl. Abstract translation from *Elek. Zeit.* A report of experimental investigations. 1200 w. Elect'n, Lond—Jan. 10, 1913. No. 39247 A.

On the Best Use of a Condenser When Used as a Shunt to a Telephone in Wireless Telegraphy. H. Smith. Abstract of a paper in Pro. Univ. of Durham Phys. Soc. An account of work undertaken to determine the most advantageous relations between the constants of the various parts of the circuit. 1200 w. Elect'n, Lond—Jan. 17, 1913. No. 39459 A.

Conductivity

Saturation Currents in Selenium. F. Kaempf. States results of an investigation. 1700 w. Elect'n, Lond—Nov. 8, 1912. No. 37635 A.

Conductors

Electrothermal Phenomena at the Contact of Two Conductors with a Theory of a Class of Radiotelegraph Detectors. W. H. Eccles. Abstract of a paper read before the Phys. Soc. 2800 w. Elect'n, Lond—Sept. 5, 1913. No. 45145 A.

Some Experiments on Contracts Be-

tween Bad Conductors. W. H. Eccles. Report of research work and results. 1800 w. Elect'n, Lond—Oct. 3, 1913. No. 45843 A.

Dielectrics

Further Investigation Into Nature of Corona and Dielectric Strength of Air. F. W. Peek, Jr. An illustrated study of the nature and properties of the loss and behavior of the air. 2500 w. Gen Elec Rev—Dec., 1912. No. 37997 C.

Tests on Dielectric Rigidity on Rubber-Insulated Cables and Wires Used in Electric Installations (Essais de rigidité diélectrique sur des câbles et des fils sous caoutchouc employés dans les installations électriques) M. H. Bureau. Report of tests at the Central Electric Laboratory. Ills. 6300 w. Bull Soc Int d'Electriciens—Aug., 1912. No. 38480 F.

The Properties of Dielectrics in Alternating-Current Fields (Gutta-Percha). G. L. Addenbrooke. Gives figures for the dielectric loss in gutta-percha when subjected to very low frequencies, such as those used in submarine cable work, upwards. 3000 w. Elect'n, Lond—Jan. 10, 1913. No. 39250 A.

Law of Corona and Dielectric Strength of Air. F. W. Peek, Jr. Explains a theory of rupture. 2500 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43210 F.

The Electric Strength of Air. J. B. Whitehead and T. T. Fitch. Describes the results of a series of investigations on the effects of pressure, temperature and density of gas upon the formation of the corona in air. 3000 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43209 F.

An Oscillograph Study of Corona. Edward Bennett. Describes a method of obtaining oscillograms of the charging current and gives a series obtained by the method. 6500 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43216 F.

A Theory of the Glow Discharge from Wires. J. S. Townsend. Report of investigations of currents that escape from high potential wires when they are surrounded by a glow or corona. 2500 w.

Consult Classification of the Index. See page 9.

Electrical Phenomena

Elect'n, Lond—June 6, 1913. No. 42879 A.

The Positive and the Negative Corona and Electrical Precipitation. W. W. Strong. High-voltage alternating current is rectified by using the Lemp synchronously rotated commutator and the coronas produced by the rectified current are used to cause the removal of suspended matter from gases. Ills. 2500 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43208 F.

The Nature of Dielectric Fatigue. W. Holtum. Abstract of a communication to the Inst. of Elec. Engrs. A report of tests made to determine the relation between the duration of application of the pressure and the instantaneous strength, with conclusions. 2000 w. Elect'n, Lond—July 25, 1913. No. 44164 A.

Electrical Phenomena

The Oil-Drop Method of Studying Electrical Phenomena in Gases. R. A. Millikan. Abstract of paper read before the Am. Elec. Chem. Soc. Outlines methods and results. 3500 w. Elect'n, Lond—Dec. 13, 1912. (Special.) No. 38845 D.

Electrons

Induction Laws and the Electron Theory (Induktionsgesetz und Elektronentheorie). Karl Pichelmayer. A statement of the hypothetical relation between these actions. Diagrams. 3200 w. Elek u Masch—June 1, 1913. No. 43044 D.

The Emission of Electrons from Tungsten at High Temperatures. Prof. O. W. Richardson. An experimental proof that the electric current in metals is carried by electrons. 2500 w. Sci Am Sup—Aug. 16, 1913. No. 44355.

Electroscopes

How to Make an Electroscope. Charles E. Benham. From the *Eng. Mech. & Wld. of Sci.* Detailed directions. 1200 w. Sci Am Sup—March 15, 1913. No. 40639.

Endosmose

Electrical Endosmose. W. D. Bancroft. Abstract of a paper read before the Am. Elec. Chem. Soc. Shows how certain apparent exceptions to the general theory can be accounted for. 1800 w. Elect'n, Lond—Jan. 17, 1913. No. 39462 A.

Energy

Flow of Energy Near a Source of Electric Current. J. Willard Milnor. Illustrates the physical meaning of Poynting's theorem. Traces the direction of energy flow in the immediate vicinity of typical generators. 1500 w. Gen Elec Rev—Feb., 1913. No. 39615 C.

The Production and Distribution of Energy. Samuel Insull. A study of the economic method of production and distribution of electrical energy and the uses

ELECTRO-PHYSICS**Insulation**

to which it can be applied. Ills. 5500 w. Jour Fr Inst—June, 1913. No. 43247 D.

Explosions

A Case of Gaseous Explosion Caused by the Electric Heating of Bitumen in Cable Troughs. Prof. W. M. Thornton and Dr. J. A. Smythe. An investigation concluding that bitumen gas lies between marsh gas and coal gas in its inflammability. 2500 w. Elect'n, Lond—Aug. 22, 1913. No. 44907 A.

Frequency

Discussion on "Frequency," Schenectady, N. Y., May 17, 1912. Discusses D. B. Rushmore's paper. 4000 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37902 F.

Hyperbolic Functions.

Application of Hyperbolic Functions. Outlines of two lectures by Dr. A. E. Kennelly, at the Polytechnic Inst., Brooklyn, N. Y. Considers long a. c. energy transmission lines, and loaded and unloaded telephone lines. 1500 w. Elec Wld—March 1, 1913. No. 40257.

Hysteresis

Experiments on Magnetic Hysteresis (Untersuchung über magnetische Hysteresis). F. Holm. Investigations on symmetrical and unsymmetrical magnetized cycles. Diagrams. 3400 w. Zeitschr des Ver deutscher Ing—Oct. 26, 1912. No. 37454 D.

The Hysteresis Loop and Index. W. M. Thornton. Gives a brief analysis of the forms of electric and magnetic hysteresis loops and discusses the question of the hysteretic index with a view to establishing its physical significance. 3000 w. Elect'n, Lond—May 16, 1913. No. 42531 A.

See Discussions, under *Miscellany*.

Inductance

Inductance of Aerial Split Conductors. Louis Cohen. Presents a formula for deriving the inductances of subdivided lines. 600 w. Elec Wld—Nov. 9, 1912. No. 37371.

The Influence of Cable Inductance Upon Duplex Balances. George Wald. Discusses the influence of cable inductance from a mathematical point of view, and shows the effect of the various factors on the working of the line. 2000 w. Elect'n, Lond—July 25, 1913. No. 44166 A.

Insulation

A Study of Insulation Problems. C. Fortescue. Revised from a paper read before the Am. Inst. of Elec. Engrs. Emphasizes a principle of electrostatic theory by which the units of a system of conductors may be arranged to protect

Consult Classification of the Index. See page 9.

Magnetic Properties

one another. Ills. 3500 w. Elec Jour—July, 1913. No. 43807.

A New Method of Hermetically Sealing Electrical Conductors Through Glass and Other Vitreous Substances. George B. Burnside. Describes method depending for its success upon the cooling of the conductor and the surrounding glass in such a way that local differences of temperature are avoided. 1500 w. Elect'n, Lond—July 4, 1913. No. 43707 A.

The Uses of Artificial Insulating Materials in the Construction of Electrical Apparatus. H. Passavant. Abstract of a paper read before the Elektrotechnische Verein. States the essential properties of insulating material and discusses points which have arisen in connection with an investigation by a commission. 1800 w. Sci Am Sup—July 19, 1913. No. 43784.

See also Micarta, under *Electro-Physics*.

Magnetic Properties

Charged Surface Layers in Contact Potential Phenomena Between Metals. A. N. Shaw. Abstract of an article in the *Phil. Mag.* Explains methods of measuring the contact potential, the detection of charged surface layers, and influence of the gaseous medium. 1200 w. Elect'n, Lond—April 11, 1913. No. 41381 A.

The Influence of Vibration and Heating on the Magnetic Properties of Sheet Iron (Einfluss von Erschütterungen und Erwärmungen auf die magnetischen Eigenschaften von Eisenblech). E. Gumlich and W. Steinhaus. Details of experimental research and general results. Diagram. 3000 w. Stahl u Eisen—Sept. 4, 1913. No. 45382 D.

Magnetism

The Effect of a Magnetic Field on Ionization Currents. William Duane. Describes experimental investigations. 4000 w. Am Jour of Sci—Feb., 1913. No. 40145 D.

The Magnetic Properties of Cast Iron from the Standpoint of an Electro-Machinist (Die magnetischen Eigenschaften des Gusseisens betrachtet vom Standpunkte des Elektro-Maschinenbauers). Friedrich Goltze. Address before the November, 1912, meeting of the Vereins deutscher Giessereifachleute. Ills. Serial, 1st part. 2100 w. Giess-Zeit—Jan 1, 1913. No. 40014 D.

The Electron Theory of Magnetism. Elmer H. Williams. Explains the essential features of the theory and gives an account of the properties of ferro-magnetic crystals, with experimental evidence in favor of the theory, and an account of phenomena which it fails to satisfy. 64 pp. Univ. of Ill, Bul 62—Nov. 4, 1912. No. 40417 N.

ELECTRO-PHYSICS

Magnetism and Electricity. F. J. Kean. Reports experimental investigations to determine the effect of magnetization upon the modulus of elasticity. Ills. 1200 w. Elec Wld—March 15, 1913. No. 40671.

Review of Electromagnetism (Revue d'électromagnétisme). Eugène Bloch. An outline of the theories advanced by various students in recent years. 9000 w. Rev gen des Sciences—April 30, 1913. No. 42181 D.

The Loss of Residual Magnetism in Heated Metals (La chute du magnétisme rémanent des métaux au chauffage). Félix Robin. Results of experiments on various magnetic materials. Ills. 10,000 w. Bull Soc Int d Electriciens—May, 1913. No. 43564 F.

The Reluctivity of Silicon Steel as a Linear Function of the Magnetizing Force. J. D. Ball. Deals with the reluctivity which over a wide range is a linear function of the magnetizing force. Curves. 1500 w. Gen Elec Rev—Oct., 1913. No. 45589 C.

A Magnetic Inspection of Sheet Iron (Zur magnetischen Untersuchung von Eisenblechen) K. Zickler. A study relative to the use of sheet iron in the construction of electrical machines and apparatus. Serial. 1st part. 3300 w. Elek u Masch—Aug. 31, 1913. No. 46076 D.

Magnets

Calculations on D. C. Electro-Magnets (Ueber die Berechnung der Gleichstrom-Elektromagnete). Franz Kraus. Presents the three typical conditions and cites six examples. Ills. 5200 w. Elek u Masch—Oct. 20, 1912. No. 37475 D.

Demagnetization and Recovery of Permanent Magnets. Shiro Sano. Reports results of experiments made to ascertain the effect of mechanical mistreatment and the recovery. 800 w. Elec Wld—Jan. 11, 1912. No. 38997.

Micarta

Properties and Uses of Bakelite Micarta. R. W. E. Moore. Information concerning the characteristics and applications of this material. Ills. 1000 w. Elec Jour—July, 1913. No. 43806.

Oscillations

Some Oscillograms of Condenser Discharges, and a Simple Theory of Coupled Oscillatory Circuits. J. A. Fleming. Abstract of a paper read before the Phys. Soc. A discussion of the phenomena. 1800 w. Elect'n, Lond—July 25, 1913. No. 44165 A.

Oscillograms

Interferential Oscillography: The Telephone Instrument as a Meter (Oscillographie interférentielle. Le téléphone in-

Consult Classification of the Index. See page 9.

Physiological Effects

strument de mesure). A. Guyan. A method of precision in the determination of wave lengths. Ills. 4900 w. Bull Soc Int des Electriciens—July, 1913. No. 45303 F.

Physiological Effects

The Principal Causes of Injury by Electricity. From a paper by Dr. H. Zangger. Shows that the extent and nature of the contact is often of more significance than the character of the source. 2500 w. Sci Am Sup—July 26, 1913. No. 43864.

Physiological Effects and Dangers from Electric Currents (Apropos des effets physiologiques et des dangers des courants électriques). Leon Gerard. A résumé of studies made by various students. 2800 w. Soc Belge des Elec—May, 1913. No. 43552 E.

Biological Structure and Electrical Phenomena (Les mecanismes biologiques et les phenomenes électriques). Daniel Berthelot. A review of the work done by physicists along the lines of electro-medicine. 3800 w. Bull Soc Int d'Electriciens—May, 1913. No. 43563 F.

Precipitation

Electric Precipitation of Suspended Particles. Linn Bradley. Brief review of the Cottrell processes for removing suspended particles from gases by means of high tension electric current, or electric field, and outlines some of the applications. Discussion. 8000 w. Pro Engr's Soc of W Penn—April, 1913. No. 42327 D.

Pseudo-Resonance

The Phenomenon of Pseudo-Resonance Observed in Neon Tubes (Sur des phénomènes de pseudo-résonance observés dans le fonctionnement des tubes au néon). G. Claude. A study of the causes of this action. Diagrams. 2400 w. Bull Soc Int d'Electriciens—Dec., 1912. No. 39079 F.

Radiations

Radiations Old and New. W. H. Bragg. Lecture before the British Assn. Considers corpuscular and other rays and their relation to molecular physics. Ills. 2500 w. Sci Am Sup—May 31, 1913. Serial, 1st part. No. 42552.

Rays of Positive Electricity. Review of a lecture by Sir J. J. Thomson to the Royal Society. 3500 w. Engng—May 30, 1913. No. 42785 A.

Radioactivity

Radioactivity. Edwin Plimpton Adams. Aims to show how far old notions of the constitution of matter are still valid, and where the physical sciences stand at present in the light of the discoveries that have been made since the discovery

ELECTRO-PHYSICS

of radioactive phenomena. Ills. 30000 w. Pro Am Inst of Elec Engrs—May, 1913. No. 42456 F.

Radioactivity. Reviews three lectures by Prof. E. Rutherford, delivered at the Royal Institution. 4000 w. Engng—July 11, 1913. No. 43899 A.

Radioactivity. Abstract of three Tyndall lectures at the Royal Institution by Prof. E. Rutherford. Deals with the more recent researches. 2800 w. Elect'n, Lond—June 27, 1913. No. 43626 A.

Radiography

Some Recent Developments in Radiography. H. Clyde Snook. Diagram and description of the Snook röntgen apparatus and its use; an improvement in stand development; a plate-holder frame, a penetrometer, &c. Ills. Discussion. 4500 w. Jour Fr Inst—Jan., 1913. No. 39354 D.

The Recombination of Ions Produced by Röntgen Rays. S. J. Plimpton. Report of experimental investigations and results. 4500 w. Am Jour of Sci—Jan., 1913. No. 39436 D.

Reactance

Synchronous and Asynchronous Reactance. J. Rezelman. Discusses fully the case of alternators having solid salient poles, both single and poly-phase. 2500 w. Elect'n, Lond—Dec. 27, 1912. Serial. 1st part. No. 38910 A.

The Reactance of Stranded Conductors. H. B. Dwight. Devises a formula for calculating the reactance of a 7-wire strand. 900 w. Elec Wld—April 19, 1913. No. 41369.

The Measurement of Reactance by the "Maximum Power" Method. A. F. Burgess. Describes the method, giving curves. 1000 w. Elect'n, Lond—April 25, 1913. No. 41918 A.

Rectifiers

The Advancement of the Mercury Arc Rectifier. Harry F. Perkins. Illustrates and describes a recent form of iron tube which is used in place of glass in the development of the rectifier for high power. 1500 w. Met & Chem Engng—Sept., 1913. No. 44967 C.

Physical Phenomena of the Mercury Arc Rectifier. F. Parkman Coffin. Reviews some of the more important related phenomena. Ills. 6000 w. Gen Elec Rev—Oct., 1913. No. 45579 C.

See Mercury Vapor, under *Lighting*.

Resistance

A Simple Kelvin Double Bridge for Comparing Two Nearly Equal Low Resistances. S. W. Melsom. Describes a simple form of Kelvin bridge designed for the purpose of testing, ammeter shunts or other resistances which are set

Consult Classification of the Index. See page 9.

Resistance Coils

nearly to a given value. Ills. 1000 w. *Elect'n*, Lond—Feb. 28, 1913. No. 40467 A.

Resistivity of a few metals Through a Wide Range of Temperature. Edwin F. Northrup and V. A. Suydam. Partial report of an investigation in progress to perfect a method for easily measuring the resistivities of metals and alloys, and to obtain data over a great range of temperature. 2000 w. *Jour Fr Inst*—Feb., 1913. No. 40093 D.

The Resistance of Contacts. Dr. Ludwig Binder. Abstract trans. from *Elektrotechnik & Maschinenbau*. Refers to contacts formed by brushes on slip-rings and commutators. 1500 w. *Elect'n*, Lond—Feb. 14, 1913. No. 40116 A.

Study of Resistance of Carbon Contacts. A. L. Clark. Abstract from *Phys. Rev.* Gives results of experimental study. 1000 w. *Elect'n*, Lond—May 23, 1913. No. 42743 A.

Electrical Contact Resistance. F. W. Harris. A summary of investigations and results. 2500 w. *Elec Jour*—July, 1913. No. 43805.

Resistance Coils

Resistance Coils for Alternating Current Work. H. L. Curtis and F. W. Grover. Gives a theoretical discussion showing the conditions which must be fulfilled in order that the phase angle shall be small and the change of resistance with frequency negligible. Gives applications, measurements, comparisons and suggestions. 6000 w. *Bul Bureau of Stand*—Nov. 1, 1912. No. 38664 N.

See also Inductance, under *Measurement*.

Resonance

Resonance in Wireless Telegraphy. W. H. Eccles. A comparison between spark systems and continuous wave systems. 1600 w. *Elect'n*, Lond—Jan. 10, 1913. No. 39249 A.

Excess Voltage Due to Resonance (Overspanning door resonantie). P. M. Verhoeckx. Theoretical discussion. *Ser. 1st part*. 5500 w. *De Ingenieur*—Feb. 8, 1913. No. 40579 D.

See also Pseudo-Resonance, under *Electro-Physics*.

Solutions

The Electrical Conductivity and Fluidity of Strong Solutions. W. S. Tucker. Abstract of a paper read before the *Phys. Soc.* Report of experimental investigations. 1500 w. *Elect'n*, Lond—April 5, 1913. No. 41226 A.

Spark Gaps.

The Sphere Spark Gap. S. W. Farnsworth and C. L. Fortesque. Discusses the limitations of the present needle point

ELECTRO-PHYSICS

spark gap and proposes the use of a spark gap having two equal spheres. Ills. 1000 w. *Pro Am Inst of Elec Engrs*—Feb., 1913. No. 40188 F.

The Maximum Voltage Gradient in a Spark Gap in Terms of the Radius of Curvature of the Electrodes. George R. Dean. Evolves a simple working formula, and shows that the spherical form of electrode may be departed from considerably provided that the curvature of the spark point is known. 800 w. *Gen Elec Rev*—March, 1913. No. 40244 C.

The Sphere Spark Gap. S. W. Farnsworth. Its advantages over the needle gap are discussed. Ills. 700 w. *Elec Jour*—May, 1913. No. 42436.

Effect of Dielectric Spark-Lag on Spark Gaps. J. P. Minton. Gives results of an experimental investigation of both needle and sphere-gaps, showing the latter is the more reliable. 2500 w. *Gen Elec Rev*—July, 1913. No. 43328 C.

Spark Voltage

Recent Experiments on the Limits of Sparking Voltages (Nouvelles expériences sur les limiteurs de tension à étincelles). Andre Léauté. Tabulated results of a series of experiments. Ills. 3500 w. *Bull Soc Int des Electriciens*—July, 1913. No. 45304 F.

Temperature Rise

Some Fundamental Considerations on Temperature Rise in Electrical Machinery. C. J. Fecheimer. Gives some of the factors affecting temperature rise. 2500 w. *Sib Jour of Engng*—Dec., 1912. No. 38654 C.

Thermocouples

Note on Cold-Junction Corrections for Thermocouples. Paul D. Foote. Considers the method of correction for cold-junction temperatures. 2500 w. *Bureau of Stand.*, No. 202—April 15, 1913. No. 44736 N.

Note on Cold-Junction Corrections for Thermocouples. Paul D. Foote. Gives method of correction for cold-junction temperatures, and methods proposed for the elimination of cold junction correction. 3000 w. *Met & Chem Engng*—June, 1913. No. 42607 C.

Some Observations on Base Metal Thermocouples. O. L. Kowalke. Read before the *Am. Elec-Chem. Soc.* Report of an investigation to determine how electromotive forces of couples varied with the temperature. 2800 w. *Chem Engr*—Sept., 1913. No. 45591 C.

Thermopiles

Note on the Construction of Thermopiles for Monochromatic Illuminators.

Consult Classification of the Index. See page 9.

Transients

W. W. Coblentz. Describes the bismuth-silver thermopile, with a completely opaque receiver, and reports tests made to determine the relative sensitivity of bismuth-iron and bismuth-silver thermopiles. 2500 w. Jour Fr Inst—May, 1913. No. 42267 D.

Transients

Elements of Electric Transients. G. Faccioli. A simple exposition of the subject. 2500 w. Gen Elec Rev—June, 1913. No. 42594 C.

Voltage

Wave-Form Hypotheses in Excess Voltage Calculations (Wellenformhypothesen in Ueberspannungsrechnungen). P. M. Verhoeckx. A mathematical study of electromagnetic waves. Diagrams. Serial. 1st part. 4000 w. Elek u Masch—Oct. 5, 1913. No. 46083 D.

Waves

The Course of Electrical Waves in Conductors with Variable Space Characteristics (Der Verlauf elektrischer Wellen auf Leitungen mit räumlich veränderlicher Charakteristik). Reinhold Rüdenberg. A study of the wave action theoretically occurring in wires and cables.

GENERATING STATIONS

Diagrams. 7000 w. Elek u Masch—May 18, 1913. No. 43040 D.

Wave Shapes

A Proposed Wave Shape Standard. Cassius M. Davis. States objections to the present wave-shape standard, and proposes a standard making use of the change of effective reactions of a condenser with change of wave shape. Ills. 1500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40182 F.

Wave Form Distortions and Their Effects on Electrical Apparatus. P. M. Lincoln. Considers deviation of the wave shape from the line form and the effect on the current wave form in connection with various kinds of circuits. 3000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40194 F.

Potential Waves of Alternating-Current Generators. W. J. Foster. Aims to discuss certain elements in design that affect the character of the potential wave; to show the effect of load and operating conditions, on the no-load wave; and to give illustrations of waves, good, bad and indifferent. 2000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40180 F.

GENERATING STATIONS

Accidents

See same heading, under *Miscellany*.

Accumulators

The Use of Storage Batteries in Modern Electrical Engineering. D. Basch. Discusses good practice in the installation, operation, and maintenance of storage batteries. The present number considers lead batteries. 5500 w. Gen Elec Rev—Nov., 1912. Serial. 1st part. No. 37216 C.

The Storage Battery. John A. Randolph. An explanation of storage battery reactions, the capacity, voltage, construction and installation. Ills. 1500 w. Power—Jan. 14, 1913. Serial. 1st part. No. 39121.

Winter Care of Storage Batteries. A. E. Wilkes. Information in regard to their proper treatment. 1400 w. Can Elec News—Jan. 1, 1913. No. 38795 C.

The Edison Storage Battery. Harold H. Smith. Illustrations, description of construction, characteristics and tests, uses, etc. General discussion of this paper and Mr. Woodbridge's paper. 8000 w. Jour W Soc of Engrs—Jan., 1913. No. 39958 D.

Some Economical Applications of the Storage Battery. J. Lester Woodbridge. Outlines the general principles and gives concrete cases to illustrate applications.

Ills. 4000 w. Jour W Soc of Engrs—Jan., 1913. No. 39957 D.

Some Features of the Edison Storage Battery. L. L. Thurstone. Describes the fundamental characteristics of the battery, including the chemical reactions, its mechanical construction and some of its operating features. Ills. 2500 w. Sib Jour of Engng—Feb., 1913. No. 40400 C.

Recent Improvements in the Storage Battery. Explains types of storage cells, and improvements introduced. Ills. 2000 w. Sci Am—March 15, 1913. No. 40448.

The Regeneration of Sulphated Storage Cells. C. W. Bennett and D. S. Cole. Abstract of paper read before the Am. Elec. Chem. Soc. Reports results of experiments which show that badly sulphated cells can be economically regenerated by electrolysis in sodium sulphate solution. 1500 w. Elect'n, Lond—March 28, 1913. No. 41133 A.

Installation and Care of Storage Batteries. H. M. Nichols. Considers the layout and installation of storage batteries, and their operation and maintenance. 2200 w. Power—July 15, 1913. Serial. 1st part. No. 43699.

The Edison Storage Battery. Harold H. Smith. Describes its construction, electrical characteristics and tests. General discussion. Ills. 5500 w. Jour

Consult Classification of the Index. See page 9.

Alabama

Cleveland Engng Soc—July, 1913. No. 44040 D.

See Batteries, under MECHANICAL ENGINEERING, *Automobiles*; also Accumulator Traction, under RAILWAY ENGINEERING, *Motive Power and Equipment*.

Alabama

Development of Alabama Water Powers. Illustrates and describes the system of the Alabama Traction Light and Power Co., Ltd., of Birmingham. 2500 w. Elec Wld—Sept. 13, 1913. No. 45115.

Auxiliary Stations

Notes on Auxiliary Stations for Hydro-Electric Plants. R. C. Muir. Reviews features having an influence on the reliability and economy of the development. 2200 w. Gen Elec Rev—June, 1913. No. 42585 C.

Batteries

The Use of a Large Lighting Battery in Connection with Central Station Supply. F. H. Whysall. Abstract of a paper read before the Inst. of Elec. Engrs. Brief description of the battery at the Dickinson St. station, Manchester, discussing the regulating cells and boosters, comparing costs, etc. 4000 w. Electr'n, Lond—Jan. 24, 1913. No. 39774 A.

A Test of an Edison Primary Battery (Edison Lalande Cell). Dudley Sanford. Report of test and results. 1200 w. Met & Chem Engng—March, 1913. No. 40329 C.

Central Stations

New Power Station and Line Construction in Lexington. Illustrated description of a recently completed plant for supplying power, light, transportation and ice. 3000 w. Elec Ry Jour—Nov. 16, 1912. No. 37608.

South Norwalk Electric Works. Gives the history, equipment, and operating and business methods of a very successful municipal electric plant. Ills. 3300 w. Munic Jour—Nov. 7, 1912. No. 37324.

Central-Station Practice at Halifax, N. S. Illustrated description of the construction and operation of a station supplying energy for railway, lighting and industrial service. 3000 w. Elec Wld—Nov. 23, 1912. No. 37770.

The Business Side of Central Station Work. Wills MacLachlan. Aims to show some of the objects of the office work. 4000 w. Ap Sci—Nov., 1912. No. 38283 C.

Opportunities in the Commercial Side of the Central Station Business. Henry Holton Scott. Shows the possibilities for men who are prepared to take the lead in this field. 2500 w. Wis Engr—Nov., 1912. No. 38564 C.

The Commercial Development of Elec-

GENERATING STATIONS

Central Stations

tricity Supply. Discusses the development in England, the need of organization, the qualifications of the commercial engineer. 3000 w. Elec Rev, Lond—Nov. 22, 1912. Serial. 1st part. No. 38020 A.

Power Stations and Sub-Stations for A. C. Railways (Kraft- und Unterwerke für Wechselstrombahnen). Herr Idelberger. Details plans of some existing stations. Ills. 2800 w. Elek Kraft u Bahnen—Nov. 14, 1912. No. 38471 D.

New Perth Amboy Central Station. Warren O. Rogers. Illustrates and describes interesting features, including the method employed in cutting in and out turbines and exciters by illuminated signals. 1500 w. Power—Jan. 14, 1913. No. 39119.

The New Plants of the Compagnie Parisienne de Distribution d'Electricité (Les Nouvelles usines de la Compagnie Parisienne de Distribution d'Electricité). Describes layout of plant. Plate. 3500 w. Tech Mod—Jan. 1, 1913. No. 39073 D.

Gas-Engine-Driven Central Station. Illustrated description of the station at Titusville, Pennsylvania, and its equipment and work. 2000 w. Elec Wld—Feb. 8, 1913. No. 39749.

The Use of a Large Lighting Battery in Connection with Central Station Supply. F. H. Whysall. Based on results obtained over two complete years' working of the 12000 ampere-hour battery installed at the Manchester Elec. Works, Dickinson St. 5000 w. Inst of Elec Engrs—March, 1913. No. 40390 N.

Turbines and Diesel Engines in Central Stations. M. Yercke. Abstract translation from the German. Gives a comparison of their relative economic importance for central-station work. 2200 w. Power—March 4, 1913. No. 40300.

The Southwest Station of the Compagnie Parisienne de Distribution d'Electricité (L'Usine Sud-Ouest de la Compagnie Parisienne de Distribution d'Electricité). The turbines and electrical machinery installed at the plant. Ills. 4000 w. Tech Mod—Mar. 15, 1913. No. 40605 D.

Central Station Practice at Cambridge, Mass. Gives the history of the plant, describing the construction of the present plant, its equipment, the installation and testing of the 625-kw. turbine, etc. Ills. 4500 w. Elec Wld—April 19, 1913. Serial. 1st part. No. 41368.

The Northwest Station of the Commonwealth Edison Company, Chicago. W. L. Abbott. Explains factors influencing the selection of the site, and illus-

Central Stations.

trates and describes the equipment of the station. Discussion. 7500 w. Jour W Soc of Engrs—Feb., 1913. No. 40409 D.

Commonwealth Edison Co.'s New Station. Illustrated description of a station in Chicago which will eventually have a capacity of 240000 kw. 2000 w. Power—April 29, 1913. No. 41679.

Analysis of Central-Station Conditions in a Small Town. Shows the possibilities, economies and advantages of combining ice-making and steam heating with an electric plant. Ills. 2500 w. Elec Rev & W Elect'n—Feb. 8, 1913. No. 39745.

Small Central Stations (Kleinere Ueberlandwerke). C. Reindl. The possibilities for small hydroelectric generating plants; their equipment, and descriptions of typical stations. Ills. Serial. 1st part. 2500 w. Zeit f d ges Turbinenwesen—March 10, 1913. No. 41456 D.

A Two-and-a-Half Billion Dollar Argument for Central Station Service. A. E. Rickards. On the advantages accruing to manufacturers from the use of central station power. 2500 w. Elec Jour—June, 1913. No. 43220.

Central Station Commercial Possibilities. H. S. Knowlton. Suggestions for the cultivation of the day load of off-peak business. 4000 w. Elec Rev & W Elect'n—May 31, 1913. No. 42654.

Central Station Practice at Waterloo, Iowa. Illustrates and describes the steam-plant and sub-station equipment, the distribution system, etc. 2500 w. Elec Wld—July 26, 1913. No. 43926.

The Generation of Electrical Energy for Smaller Towns. M. M. Inglis. Gives data concerning consumption of light and power, and features governing plant design and equipment. 2500 w. Can Engr—July 10, 1913. No. 43682.

Savannah Electric Co.'s New Power Plant. Warren O. Rogers. Illustrated description of this new, 11000-kw. capacity, steam turbine central station. 3000 w. Power—July 29, 1913. No. 43946.

Sectionalizing Devices for Central Stations. F. Heppenstall. Presents the advantages of sectionalizing and gives diagrams showing the system as applied to three-phase current. 1500 w. Elect'n, Lond—June 20, 1913. Serial. 1st part. No. 43375 A.

The Causes of Fires in Central Stations and Their Remedy. Andre Gerard, in *La Lumière Electrique*. Calls attention to sources of danger recently introduced and gives preventive suggestions. 1500 w. Elec Rev & W Elect'n—Aug. 23, 1913. No. 44559.

Central Station Development at Hart-

GENERATING STATIONS

Combination Stations

ford. Reports the inauguration of an electric-truck battery interchange system on mileage basis, codification of electric rate schedules, and development of industrial electric heating. Ills. 3000 w. Elec Wld—Sept. 6, 1913. No. 45010.

Springfield Electric-Light Plant. Warren O. Rogers. Contains turbine units in both the old and new sections, vertical porcupine boilers supplying them with steam. Ills. 2000 w. Power—Sept. 2, 1913. No. 44900.

Importance of a Good Distributing System for a Central Station. M. D. Cooper. Considers losses due to voltage drop, and the effect on the various appliances. 1200 w. Wis Engr—Oct., 1913. No. 46310 C.

The Central Station in the Small Town. H. L. Titus. Read at convention, Glenwood Springs, Colo. Suggestions for increasing the power load. 3000 w. Elec Rev & W Elect'n—Oct. 11, 1913. No. 45794.

See also Cost, under *Generating Stations*, and Instrument Testing, under *Measurement*.

Chicago

The Commonwealth Edison Company. Gives the history of the development of the Chicago central station. Ills. 5500 w. Elec Rev & W Elect'n—May 31, 1913. No. 42653.

Electric Service in Chicago. A survey of what has been accomplished in the manufacture, distribution and sale of electricity. Ills. 5000 w. Elec Wld—May 31, 1913. No. 42648.

Electric Service in Chicago Suburbs. An illustrated account of the high system load-factors and operating economies achieved through the diversified demands of customers. 7500 w. Elec Wld—June 7, 1913. No. 42728.

Combination Plant

Central-Station Ice-Making. Shows that the two plants can be run on a more economical basis than would be possible with either plant running singly. Ills. 3500 w. Elec Rev & W Elect'n—Jan. 4, 1913. No. 38815.

Combination Railway. Electric and Ice-Making Plant. A. R. Smith. Illustrated description of a reconstructed station at Hampton, Va. 2500 w. Elec Wld—Aug. 23, 1913. No. 44561.

Combination Stations

The Simultaneous Production of Electric Energy and Heat (Production simultanée d'énergie électrique et de chaleur). M. A. Beurrienne. Different machine combinations for the production of motive power and heat. Ills. 15000 w. Mem

Consult Classification of the Index. See page 9.

Costs

GENERATING STATIONS

Hydro-Electric

Soc Ing Civ de France—Nov., 1912. No. 40074 G.

Cooling Plant

Notes on Cooling Generating Plant. W. Bolton Shaw. Considers types of generating plant practical for an electrical installation. 4500 w. Ir & Coal Trds Rev—May 9, 1913. No. 42298 A.

Cooling Water

Supply of Cooling Water for Power Stations. Fred Buch. Considers high-head developments, low-head developments, de-aerating or storage tanks, and ponds and reservoirs. 2000 w. Elec Wld—May 3, 1913. No. 41884.

Costs

Cost of Power in Central Stations. Henry D. Jackson. Shows the initial cost per kilowatt and the cost of producing a kilowatt-hour. 3000 w. Power—Nov. 12, 1912. No. 37373.

Standardization of Method for Determining and Comparing Power Costs in Steam Plants. H. G. Stott and W. S. Gorsuch. Considers the fundamental basis should be per kw.-hour net output. Discusses methods. 9000 w. Pro Am Inst of Elec Engrs—May, 1913. No. 43454 F.

The Cost of Manufacturing Electricity. H. M. Hobart. Considers the production costs, investment costs, administration costs, influence of load-factor, and of power-factor, and gives a bibliography. 5000 w. Gen Elec Rev—Sept., 1913. No. 44829 C.

The Determination of Operating Costs of Power Installations. C. A. Fees. Read before the Kansas Gas, Water, Elec. Light, and St. Ry. Assn. Gives some of the methods of determining the costs. 2200 w. Elec Rev & W Elect'n—Oct. 18, 1913. No. 45958.

Relation of Plant Size to Power Cost. P. M. Lincoln. Gives reasons why a central station plant can take care of a given service more economically than a small plant. 4000 w. Pro Am Inst of Elec Engrs—Oct., 1913. No. 46340 F.

Dover, Eng.

Electricity Supply in Dover. An account of the central station and its working. 1200 w. Elec Rev, Lond—Aug. 29, 1913. Serial, 1st part. No. 45027 A.

Draft Tubes

Method for Designing Concrete Draft Tubes. Gives a method derived by Herr R. Dubs, and published in *La Houille Blanche*. 700 w. Eng Rec—Aug. 9, 1913. No. 44243.

Engines

See Gas Engines, under MECHANICAL ENGINEERING, *Combustion Motors*.

Equipment

Electrical Features Power House No.

1, Tennessee Power Co., Parksville, Tenn. Illustrated detailed description of this development. 6000 w. Elec Engng—April, 1913. No. 41326.

Extensions

The "1912 Extension" to Fisk Street Station. Illustrated description of very large turbo-generators and details of power house design in Chicago. 3000 w. Elec Wld—Oct. 18, 1913. No. 45960.

Floods

Restoring Submerged Electrical Apparatus to Service After Flood. George H. Morse. Illustrated description of methods used by the writer at Wheeling, W. Va. 1000 w. Elec Wld—April 19, 1913. No. 41370.

Hydro-Electric

The Cornell University Hydro-Electric Power Plant. George S. Macomber. Illustrated description. 1200 w. Sib Jour of Engng—Nov., 1912. No. 37537 C.

A 120,000 Kw. Hydro-Electric Power Development With 4,000-Ft. Head. Illustrated description of the plant at Big Creek Falls, California, developing this amount of power. 2200 w. Eng News—Nov. 7, 1912. No. 37312.

Carp River Hydro-Electric Development. Illustrated description of an 8,000-h. p. hydro-electric plant to furnish power for adjacent mines and mill plants in Michigan. 1800 w. Eng Rec—Nov. 23, 1912. No. 37757.

Hydro-Electric Developments on the Presumpscot River. Henry W. Foster. Notes from a paper read before the Maine Soc. of Civ. Engrs., describing developments along this river and the discharge of the stream. 2000 w. Eng Rec—Nov. 2, 1912. No. 37221.

Hydro-Electric System of Appalachian Power Company. L. S. Gresham. Illustrates and describes details of plants No. 2 and 4 and the transmission system. 2500 w. So Elect'n—Nov., 1912. No. 37656.

Wachusett Dam Hydro-Electric Plant. Warren O. Rogers. Illustrates and describes details of this plant at Clinton, Mass. 1000 w. Power—Nov. 26, 1912. No. 37782.

The Arniberg Electric Plant at Amsteg (Das Elektrizitätswerk Arniberg bei Amsteg). Topographic maps and general plans of reservoir, pipe line, and power house of this plant in Switzerland. Ills. Serial. 1st part. 2000 w. Schweiz Bau—Oct. 5, 1912. No. 37433 D.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. This first of a series of six articles presents the selection and arrangement of the various apparatus comprising a complete

Consult Classification of the Index. See page 9.

Hydro-Electric

GENERATING STATIONS

Hydro-Electric

equipment. Ills. 6200 w. Engineering Magazine—Jan., 1913. No. 38683 B.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. This second article of a series considers transformers and switching equipment. Ills. 6500 w. Engineering Magazine—Feb., 1913. No. 39426 B.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. This third article of a series considers cabling, wiring and line construction. Ills. 2000 w. Engineering Magazine—March, 1913. No. 40086 B.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. This fourth article of a series discusses insulators, line crossings and sub-station apparatus. Ills. 5000 w. Engineering Magazine—April, 1913. No. 40910 B.

The Commercial Side of a Small Hydroelectric Property. Explains conditions and methods pursued. 2000 w. Elec Rev & W Elect'n—March 8, 1913. No. 40378.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. Fifth article of a series dealing with frequency changers and synchronous converters. Ills. 6000 w. Engineering Magazine—May, 1913. No. 41630 B.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. Sixth article of a series covering synchronous condensers, boosters, and indoor switching equipment. Ills. 4500 w. Engineering Magazine—May, 1913. No. 42490 B.

The Generation and Transmission of Hydroelectric Power. E. A. Lof. Seventh and last article of a series. Discusses the commercial opportunities for the utilization of water power. 8000 w. Engineering Magazine—July, 1913. No. 43095 B.

Generators for Hydroelectric Power Stations. Eric A. Lof. Shows how the number, speed and capacity of generating units are affected by hydraulic conditions and by the economical rating of water wheels. 4500 w. Gen Elec Rev—June, 1913. No. 42587 C.

The World's Largest Water-Power Plant. Illustrated description of the development at Keokuk, Iowa, interesting for its size and numerous features of hydraulic and electrical construction. 7000 w. Elec Wld—May 31, 1913. No. 42650.

Two Hundred Thousand Horse Power. Illustrated description of the great engineering works at Keokuk, Iowa, utilizing the waters of the Mississippi. 4000 w. Cassier's—July, 1913. No. 43349.

Power from the Mississippi River. Il-

lustrated description of the development at Keokuk, Iowa, and its construction. 4000 w. Power—Aug. 5, 1913. No. 44152.

Opening of the World's Greatest Power Plant. Brief illustrated description of the Keokuk dam and power house for generating 300,000 h. p. by the Mississippi River. 1700 w. Sci Am—Sept. 13, 1913. No. 45063.

Three Hundred Thousand Horse-power Hydroelectric Plant at Keokuk, on the Mississippi (Usine hydro-electrique, de 300,000 chevaux, de Keokuk, sur le Mississippi). P. Calfas. Brief general description of the plant. Ills. 2000 w. Genie Civil—July 26, 1913. No. 45342 D.

Hydroelectric Energy for Coal Fields. Illustrated description of the system of the Appalachian Power Co., on the New River in Virginia. Also editorial. 2800 w. Elec Wld—Nov. 30, 1912. No. 37948.

Hydro-Electric Power in the Butte-Anaconda District. Warren Aikens. Illustrates and describes the system which supplies electric current to the mines, and smelters. 4000 w. Min & Engng Wld—Nov. 30, 1912. No. 37954.

A Unique Utah Water Power. Illustrated description of the new Riverdale plant, utilizing an irrigation canal. 2000 w. Elec Wld—Dec. 7, 1912. No. 38096.

Riverdale Hydroelectric Plant. Illustrated description of a plant in Utah having automatically controlled relief valves and water saving devices at the end of long penstocks in place of the usual surge tank and standpipe. 2000 w. Eng Rec—Dec. 14, 1912. No. 38195.

New Norwegian Hydroelectric Project. Illustrated description of the development of the water-power of the Samnanger watershed for the City of Bergen. Also editorial. 2700 w. Elec Wld—Dec. 14, 1912. No. 38212.

The Hydro-Electric Plant of the Sherbrooke Railway and Power Company at Sherbrooke, P. Q. Abstracts from a paper by C. L. Cate describing the design and construction of the plant. 6000 w. Can Engr—Dec. 5, 1912. No. 38087.

The Vancouver Island Power Company, Limited, Jordan River Development. Illustrated description of the development, the Bear Creek dam and reservoir, the intake tower, etc. A plant constructed under difficulties. 5000 w. Can Engr—Nov. 28, 1912. Serial. 1st part. No. 37928.

Bull Run Hydroelectric Plant. C. E. Hickok. Illustrated description of a 25,000-h. p. development near Portland, Ore. 1500 w. Eng Rec—Jan. 18, 1913. No. 39190.

Consult Classification of the Index. See page 9.

Hydroelectric

GENERATING STATIONS.

Hydroelectric

Hydroelectric Plant at Trollhättan, Sweden. Illustrated detailed description of the 100,000-h. p. generating station built by the Swedish government for supplying energy at low rates. 3000 w. Elec Wld—Jan. 11, 1913. No. 38996.

The World's Largest Hydro-Electric Development at Keokuk, Iowa. J. H. Alexander. Illustrated description of the dam, power house and turbines, switching arrangements, station auxiliaries, &c. 3000 w. So Elect'n—Jan., 1913. No. 39212.

Hydroelectric Development Replacing Old Power Canal System. A short cut-off around the Great Falls of the Passaic River in Paterson, N. J., makes 6500 h.p. available. Illustrates and describes details of the development. 2000 w. Eng Rec—Feb. 22, 1913. No. 40100.

Power Developments on the Deerfield River, Massachusetts. Map and illustrated description of the complete utilization of the power possibilities by storage reservoirs and interconnected power stations. 3500 w. Eng Rec—Feb. 1, 1913. Serial, 1st part. No. 39644.

Waterbury and Bull's Bridge Plants. Warren O. Rogers. The Waterbury plant consists of four steam turbine units and a large transformer station. The Bull's Bridge plant contains six 1000-kw. hydroelectric turbo-generators. Ills. 1500 w. Power—Feb. 11, 1913. No. 39756.

The Hydro-Electric Developments of the Great Western Power Company. R. B. Mateer. Map and illustrated description of developments in California. 2000 w. So Elect'n—Feb., 1913. No. 39875.

200,000 Horse Power Hydroelectric Power Plant at Keokuk, Iowa, and Hamilton, Ill. H. M. Nelson. Illustrates and describes a plant under construction on the Mississippi River at the foot of the Des Moines Rapids. 3500 w. Cornell Civ Engr—Feb., 1913. No. 40090 C.

The Town of Magog, Municipal Hydro-Electric Development. A. C. Doherty. Illustrated description of a development in Quebec. 1200 w. Can Engr—Feb. 13, 1913. No. 39826.

The "Motor" Company's Water Power Plant at Biaschina and Ticinetto, Baden, Switzerland. (Die Wasserkraftanlagen Biaschina und Ticinetto der A.-G. "Motor," Baden, Schweiz). Maps, description and illustrations of this 38,000 horsepower plant. Serial, 1st part. 1600 w. Zeit f d ges Turbinenwesen—Jan. 10, 1913. No. 40054 D.

Power Plant of the Victoria Falls and Transvaal Power Co. in South Africa (Die Anlagen der Victoria Falls and

Transvaal Co. in Südafrika). S. Klingenberg. Details of the layout of this 40,000-volt station. Ills. Serial, 1st part. 5,000 w. Zeitschr des Ver deutscher Ing—Jan. 4, 1913. No. 40035 D.

Pumping Water to Increase the Supply for a Hydroelectric Plant. M. B. Lott. Illustrated description of the Mill Creek pumping station, near Salt Lake City, Utah, which augments a high head flow by a comparatively low lift. 2500 w. Eng Rec—March 15, 1913. No. 40643.

Appalachian Hydro-Electric Development. Warren O. Rogers. Illustrated description of an installation consisting of five power-plants on the New River, Va. 1500 w. Power—March 25 1913. No. 40795.

Mount Hood Hydroelectric Developments. W. P. Brereton and R. H. Mulock. Illustrates and describes the hydraulic features of a system for generating 60000 h.p. from glacial streams and transmitting it to Portland, Ore. 2500 w. Elec Wld—March 22, 1913. Serial. 1st part. No. 40778.

The Arnberg Hydro-Electric Power Station. Illustrated detailed description. 2500 w. Engr, Lond—Feb. 28, 1913. No. 40492 A.

The Sainnanger Hydroelectric Plant. Illustrated description of a high-head development built by the City of Bergen, Norway. 2500 w. Eng Rec—March 22, 1913. No. 40768.

The Hydroelectric Plant at Biaschina, Switzerland (L'usine hydro-électrique de la Biaschina, Tessin, Suisse). Ch. Dantin. Brief description of building and installations. Ills. and plate. 1600 w. Genie Civil—March 15, 1913. No. 40600 D.

A 300,000-Horsepower Hydroelectric Plant in the United States (Une usine hydro-électrique d'une puissance de 300,000 chevaux aux Etats-Unis). Richard Muller. Description of the generating station at Keokuk, Iowa. Ills. 2400 w. Tech Mod—Mar. 15, 1913. No. 40604 D.

Water Power. W. G. Swendsen. Brief discussion of the hydroelectric development. 1800 w. Jour of Idaho Soc of Engrs—June, 1912. No. 41729 N.

Hydro-Electric Power-Plant in San Juan, Argentina. Illustrations with brief description of the difficulties of transport and erection of the plant. 1200 w. Engng—March 21, 1913. No. 41018 A.

Swiss Hydroelectric Developments. Data on water-power developments, with comparison of steam and gas-electric plants and transmission systems. Ills. 2500 w. Elec Wld—April 12, 1913. No. 41190.

Hydroelectric

GENERATING STATIONS

Hydroelectric

Swiss Hydroelectric Developments. Illustrates and describes some of the more important plants. 4000 w. Eng Rec—April 26, 1913. No. 41542.

The Developments in Water Power Machinery and Water Power Plants (Die Entwicklung der Wasserkraftmaschinen und Wasserkraftanlagen). A. Budau. Hydroelectric power production and machinery in the past 30 years. 5600 w. Elek u Masch (Special)—March 1913. No. 41484 D.

The Value of the Pangani Falls for Supplying Electric Energy to Northern German East Africa (Die Nutzbarmachung der Panganifälle für die Versorgung des Nordens von Deutschostafrika mit elektrischer Energie). Herr Dominick. An outline of the power available from this source. Maps. 3000 w. Glasers Ann—Mar. 15, 1913. No. 41453 D.

The Use of Water Power on the Upper Sources of the Weser (Die Ausnutzung der Wasserkräfte im oberen Quellgebiete der Weser). Herr Bartel. A study of available supplies, present development, and topographic features. Ills. and Map. 5000 w. Elek Kraft u Bahnen—Apr. 4, 1913. No. 41502 D.

Hydroelectric Development and Hoist System of Cleveland-Cliffs Iron Co. Illustrated description of a recently completed 8000 h. p. station near Marquette, Mich. 2000 w. Elec Engng—May, 1913. No. 41950.

Hydroelectric Developments at Niagara Falls. Albert F. Ganz. Describes the present power plants. Map. 4000 w. Stevens Ind—April, 1913. No. 42415 D.

The Hydro-Electric Development of the Braden Copper Co. C. G. Newton. Illustrated description of a development on the Cachapual River, Chile. 2000 w. Eng News—May 22, 1913. No. 42348.

Hydroelectric Plant for Sawmill Use at Hartland, Vt. M. A. Hicks. Illustrated description of an interesting plant, located in a V-shaped gorge. 2000 w. Elec Wld—May 17, 1913. No. 42227.

Hydro-Electric Possibilities of the Maitland River, Ontario. Report by H. G. Acres, giving data regarding the hydrology of the stream, with an analysis of the possibilities of its commercial development. 3000 w. Can Engr—May 8, 1913. No. 41970.

McCalls Ferry Hydro-Electric Plant. Charles H. Bromley. Brief illustrated description of the construction and equipment of this plant on the Susquehanna River. 4000 w. Power—May 13, 1913. No. 42016.

Method of Constructing a Hydroelectric Power House and Dam on Sand Foundations. An account of interesting

work near Prairie du Sac, Wis. Ills. 2500 w. Engng & Con—May 7, 1913. No. 41910.

Mockfjård Hydroelectric Development. Illustrated description of a power plant in Sweden where the turbines have been placed at the bottom of cylindrical shafts. 2000 w. Eng Rec—May 10, 1913. No. 41955.

Municipal Power Plant of Eugene, Ore. Illustrated description of a hydroelectric generating station, transmission and distribution systems on the McKenzie River, supplying energy to a municipality of about 12,000 inhabitants. Costs are given. 2000 w. Elec Wld—May 17, 1913. No. 42226.

Subterranean Swedish Generating Plant. Illustrated description of the hydraulic-electric generating and transmission equipment of the Vesterdalen Power Co. at Mackfjård, part of a 65000 h. p. interconnected system. 2200 w. Elec Wld—May 10, 1913. No. 41964.

Twin Falls Hydroelectric Development. George C. Newton. Plan and illustrated description of the construction of a power plant on the Menominee River between Michigan and Wisconsin. 6500 w. Eng Rec—May 24, 1913. Serial. 1st part. No. 42377.

The Projected Sauer River Dam in the Grand Duchy of Luxembourg (Ueber das Projekt der Sauerstalsperre im Grossherzogtum Luxemburg). J. P. Manternach. A review of the electric power possibilities, and the present scheme of the Transport Development and Power Syndicate, Ltd. 4800 w. Elek Kraft u Bahnen—April 24, 1913. No. 42157 D.

A Review of Recent Progress in the Engineering of Hydroelectric Power Plants and Transmission Systems. David B. Rushmore. Ills. 2500 w. Gen Elec Rev—June, 1913. No. 42580 C.

Construction Work on the Prairie du Sac Power Plant. Illustrated description of the cofferdam and contractor's equipment for building dam and power house of a large hydroelectric installation. 2500 w. Eng Rec—May 31, 1913. No. 42644.

Hydro-Electric Plant at Worcester. Illustrated description of the 450-B.H.P. water-turbine at the Powick power-station. 1500 w. Engng—May 23, 1913. No. 42776 A.

Hydro-Electric Power at Mason Valley, Nev. Warren Aikens. Illustrates and describes the Truckee River General Electric Co. power plant at Reno, Nev. 3500 w. Min & Engng Wld—June 7, 1913. No. 42721.

Klamath River Hydroelectric Development. J. C. Boyle. Brief illustrated

Consult Classification of the Index. See page 9.

Hydroelectric.

GENERATING STATIONS

Hydroelectric

description of a new 53000-hp. plant for the California-Oregon Power Co. 2500 w. Eng Rec—June 7, 1913. No. 42714.

Pressure Regulation for Hydroelectric Plants. C. A. Tupper. Considers some of the problems involved in regulating the speed of hydroelectric units, with special reference to types receiving the water supply from enclosed flumes or pipe lines. Ills. 2200 w. Min & Engng Wld—June 21, 1913. No. 43115.

The Generating System of the Columbus Power Co., Columbia, Ga. D. H. Braymer. Illustrated description of the Goat Rock hydroelectric development and transmission system. 3000 w. Elec Engng—June, 1913. No. 42724.

Hydro-Electric Development and Water Conservation. Morris Knowles. Revised from an address before the Am. Inst. of Elec. Engrs., Feb. 8, 1913. Discusses what should be done to secure the best utilization of the water resources of the country. 2500 w. Elec Jour—July, 1913. No. 43804.

Hydro-Electric Power for B. C. Mines. Jared Thompson. Brief illustrated description of the plant at Bonnington Falls on the Kootenay river, supplying current to the Rossland-Nelson districts. 1800 w. Min & Engng Wld—July 5, 1913. No. 43447.

A Hydro-Electric Plant to Supply Coal Mines. Illustrated description of a plant which proposes to supply mines in W. Va. distant from 45 to 65 miles from the central station. 2200 w. Coal Age—July 5, 1913. No. 43443.

New Hydro-Electric Plant in Northwest. Edward A. West. Illustrated description of the Bull Run development of the Portland Railway, Light & Power Co. with ultimate capacity of 15000 kw. 2000 w. Elec Trac—July, 1913. No. 43810.

Raystown Hydroelectric Plant. Illustrated description of the development and methods of construction. Includes a concrete dam with stepped spillway and hidden fishway. 2000 w. Eng Rec—June 23, 1913. No. 43302.

A 40000-hp Swiss Hydroelectric Plant. Illustrates and describes a development at Biaschina, in southern Switzerland, utilizing 870 ft. head of Tessin River to furnish energy for nearby electrochemical industries. 1800 w. Elec Wld—July 12, 1913. No. 43678.

The Hydro-Electric Rules and Regulations and the National Electric Code. H. F. Strickland. Brief outline of the rules and their aims. 2400 w. Can Elec Assn—June, 1913. No. 44814 N.

Hale's Bar Development of the Chattanooga and Tennessee River Power Co.

B. T. Burt. Illustrated description of one of the largest water power developments in Tennessee. 3000 w. Elec Engng—Aug., 1913. No. 44291.

Hydro-Electric Development in California. John A. Britton. Illustrated general survey of the present situation. 5000 w. Sci Am Sup—Aug. 2, 1913. No. 44075.

Hydro-Electric Development in Montana. Max Hebgren. Explains the natural features of the state affecting power development, considers the early and late developments, the capacity, transmission, character of load, &c. Ills. 5000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44755 F.

Hydroelectric Plant on White Salmon River. Wilbur B. Foshay. Brief illustrated description of a system employing immense wood-stave pipe. 1000 w. Elec Wld—Aug. 9, 1913. No. 44270.

Tacoma's Nisqually River Development. R. H. Richards. The hydraulic features of a 19,000 k. w. municipal plant, utilizing a 500-ft. fall in the glacier-fed Nisqually River, are illustrated and described. 1200 w. Elec Wld—Aug. 2, 1913. No. 44146.

White River Hydroelectric Plant. Illustrates and describes this first of a series of plants designed to develop the power of this stream in Missouri. 2500 w. Eng Rec—Aug. 2, 1913. No. 44125.

Preliminary Studies for the Development of a 300,000 H. P. Hydro-Electric Plant at the Dalles of the Columbia River. Discussion and data from the technical report on this project. 8500 w. Engng & Con—Sept. 10, 1913. No. 45061.

Hydro-Electric Development at Dryden, Ont. Illustrated description of a development of 2,000 h. p. capacity, to be used for operating sulphite pulp mills, and for supplying light and power to the town. 1800 w. Con Rec—Sept. 3, 1913. No. 44936.

Large Power System in South Africa. Dr. G. Klingenberg. Abstract translation from *Zeit. des Ver. Deut. Ing.* Map and description of power distribution systems on the Rand, showing air and electric transmission lines. 2500 w. Power—Sept. 9, 1913. No. 45013.

Puntledge Hydroelectric Power Plant. Illustrated description of an ultimate development of 19,000 horsepower, which will supersede separate steam plants used for the operation of coal mines at Vancouver Island. 3000 w. Eng Rec—Sept. 20, 1913. Serial, 1st part. No. 45266.

Novel Features in Flume and Penstock Design: The Puntledge River

Hydroelectric

GENERATING STATIONS

Load Factors

Power Development, Vancouver, B. C. Illustrated description of the impounding and diversion dams, semi-circular flume, head gates, and other features. 5500 w. Eng News—Oct. 23, 1913. No. 46156.

Cedar Rapids Hydroelectric Development. The plant has eighteen 10800 h. p. turbines, receiving water from the St. Lawrence River. Ills. 2500 w. Eng Rec—Oct. 25, 1913. No. 46209.

Hydro-Electric Power Development Near Calgary, Alta. W. W. Hay. Illustrated description of a development on the Bow River at Kananaskis Falls. 3000 w. Con Rec—Oct. 1, 1913. No. 45634.

Hydroelectric Energy for Worcester Railway System. Illustrates and describes features of Connecticut River Transmission Co.'s 120000-volt lines and substations. 3000 w. Elec Wld—Oct. 4, 1913. Serial. 1st part. No. 45681.

Hydro-Electric Power Plant at Chester. Illustrated detailed description of the plant on the banks of the river Dee for utilizing the water power. 3000 w. Engr., Lond—Oct. 17, 1913. No. 46250 A.

The Chester Hydro-Electric Plant. Illustrated description of the plant in this old English city. 1600 w. Elec Rev, Lond—Oct. 17, 1913. No. 46225 A.

White Salmon River Power Development. R. M. Overstreet. Illustrated description of a medium-head hydroelectric station in the State of Washington, served by a wood-stave-pipe line 13.5 feet in diameter and 5,070 feet long. 2500 w. Eng Rec—Oct. 11, 1913. No. 45808.

The Ruetz Generating Station of the Mittenwald Railway (Das "Ruetz-Elektrizitätswerk" der mittenwalder Bahn) Carl Reindl. The first instalment presents a general description of the aqueduct line to the power house. Ills. Serial. 1st part. 1400 w. Zeit d ges Turbinenwesen — Sept. 10, 1913. No. 46068 D.

See also Water Wheels, under MECHANICAL ENGINEERING, *Hydraulic Machinery*, and Power Plants, under MECHANICAL ENGINEERING, *Power and Transmission*; and Auxiliary Stations, under Electrical Engineering, *Generating Stations*.

Illinois

Commercial Development Under Group Control. A report of new lighting and motor business in northwestern Illinois, following consolidation. Ills. 3500 w. Elec Wld—June 7, 1913. No. 42729.

Incandescent Lamps

Rate Systems From the Central-Station

Solicitor's Viewpoint. J. E. Bullard. Discusses the effect of different types of rate schedule on the consumer and points out some of the methods of explaining rate schedules to prospective customers. 1600 w. Elec Wld—Nov. 16, 1912. No. 37613.

Isolated Plants

Practical Co-Operation Between Central Station and Isolated Plant. Percival-Robert Moses. Advocating joint operation to take care of the peak load from the power requirements of each. Diagrams. 5000 w. Engineering Magazine—Jan., 1913. No. 38682 B.

The New Generating Station at the Britannia Works of Messrs. Dorman, Long & Company, Ltd. Illustrated detailed description. 3000 w. Ir & Coal Trds Rev—Jan. 3, 1913. No. 39175 A.

Electrical Equipment of a Modern Building. Illustrated description of the isolated 500-kw. generating plant for Æolian Hall, New York. 3000 w. Elec Wld—Feb. 22, 1913. No. 39994.

Isolated Plant of Gasoline Engine Factory. Harry C. Spillman. Illustrates and describes features of an electrical and steam-heating station in Detroit. 2000 w. Elec Wld—Feb. 15, 1913. No. 39882.

The Unit Power Plant for Isolated Buildings and Small Groups. Charles L. Hubbard. First of a series of articles discussing the subject especially from the architect's point of view. 8500 w. Br Build—Feb., 1913. Serial. 1st part. No. 40243 D.

See also Management, under INDUSTRIAL ECONOMY.

Load Curves

Steam and Electric Load Curves in Large Buildings. Gives an interesting collection of curves collected by the committee on heating of the Nat. Elec. Light Assn. 1000 w. Power—July 1, 1913. No. 43322.

Load Equalizers

Flywheel Load Equalizers. Explains the principle and describes typical installations. Ills. 4500 w. Elect'n, Lond—Dec. 13, 1912. (Special.) No. 38854 D.

Load Factors

Characteristics of Substation Loads at the Anthracite Collieries of the Lackawanna R. R. Co. H. M. Warren and A. S. Biesecker. Deals with a series of tests made on substations which supply power for driving d. c. machinery at the anthracite mines. Discusses the effect of the load factors and peaks on the size and type of apparatus. 1500 w. Pro Am Inst of Elec Engrs—April, 1913. No. 41672 F.

Consult Classification of the Index. See page 9.

Loads

Loads

Building Up a Day Load for a Small Central Station. William E. Haseltine. Explains how a 24-hour service was successfully established in a community of less than 4000 under most unfavorable circumstances. 3500 w. Elec Rev & W Elect'n—Jan. 25, 1913. No. 39414.

Mining Loads for Central Stations. Wilfred Sykes and Graham Bright. Discusses the desirability of mining loads for central stations from the viewpoints of both the mine operators and central station operators. Also rates. 5500 w. Pro Am. Inst of Elec Engrs—May, 1913. No. 42451 F.

Refrigeration a Desirable Load for Central Stations. Excerpts from report of the Committee on Refrigeration read before the N. E. L. A. 2000 w. Power—June 24, 1913. No. 43124.

Unified Public Utilities in Central Illinois. Describes plans of an interconnected system for supplying 25 communities from 700 miles of 33,000-volt transmission lines. Ills. 7500 w. Elec Wld—May 31, 1913. No. 42649.

London

Electric Supply in London. Frank Bailey. Reviews the development and describes the works, giving information concerning applications, rates, etc. Discussion. 9500 w. Jour Soc of Arts—April 11, 1913. No. 41371 A.

Manchester, Eng.

Recent Developments at Stuart Street Station, Manchester. Illustrates and describes interesting features. 1200 w. Elec Rev, Lond—July 27, 1913. Serial, 1st part. No. 43620 A.

Municipal Station

British Steam Turbo-Generator Stations. History and illustrated description of features of the first municipal electricity supply station established in England. 3500 w. Elec Wld—Nov. 9, 1912. No. 37370.

Operation

Commonwealth Edison System Operating Features. Describes the work of the load dispatcher and the operating system. Ills. 2000 w. Elec Wld—Sept. 27, 1913. No. 45492.

Power-Factor

The Design of Apparatus for Improving the Power-Factor of Alternating-Current Systems. Miles Walker. Discusses the principles involved of a paper read before the Inst. of Elec. Engrs. Abstract. Leblanc's phase-advancers are described, and the design of a phase-advancer is considered in detail. 3500 w. Elect'n, Lond—Jan. 10, 1913. No. 39251 A.

The Application of Synchronous Mo-

GENERATING STATIONS

Prime Movers

tors to a Water Power Transmission System for the Betterment of Service Standards. Lucius B. Andrus. Outlines the system of the Indiana and Michigan Electric Co. as now operated, explaining conditions. 8800 w. Pro Am Inst of Elec Engrs—March, 1913. No. 40442 F.

Power Houses

The Power House of the Belgard Long-Distance Station (Das Kraftwerk der Ueberlandzentrale Belgard, Akt.-Ges.). H. Scholl. The formulæ used to determine stresses of all kinds in the reinforced structure adopted. Ills. 3600 w. Beton u Eisen—June 12, 1913. No. 43520 E.

Power Plants

Power Plants and Energy Distribution with Special Attention to Overhead Transmission of 150,000 Volts (Grosskraftwerke und Energieverteilung unter besonderer Berücksichtigung der oberen Spannungen bis 150,000 Volt). F. Bartel. The first installment discusses the utility of peat as a fuel in power generation. Ills. Serial. 1st part. 3000 w. Glaser's Ann—Nov. 15, 1912. No. 38431 D.

Developments During 1912 in Power Plant Design. Henry H. Norris. An account of the progress of the year in the field of power generation, including brief descriptions of recent typical power plants. 6000 w. Elec Ry Jour—Jan. 4, 1913. No. 38826.

Jacksonville Municipal Power Plant. C. C. Austin. Illustrated description of a turbine power plant of 6000 kw. capacity. Fuel oil is used in the boiler furnaces. 900 w. Power—May 6, 1913. No. 41889.

New Electric Power House for Stoke-on-Trent. Illustrated description of this new plant. 2500 w. Engr, Lond—April 18, 1913. No. 41776 A.

Power Systems

Some Features of the Pacific Light and Power System. B. P. Rowe. Information concerning a system under construction which will operate at a line voltage of 150,000 volts. 1700 w. Elec Jour—Aug., 1913. No. 44595.

Profitable Station in a Town of 3,500 Inhabitants. Illustrated description of the rehabilitation of the system at Walton, N. Y. 2000 w. Elec Wld—Aug. 16, 1913. No. 44415.

Prime Movers

Prime Movers for Electric Power. Dr. S. Z. de Ferranti. Read before the Incor. Munic. Elec. Assn. Brief paper favoring the turbine system, with general discussion. 4800 w. Elect'n, Lond—June 20, 1913. No. 43371 A.

Consult Classification of the Index. See page 9.

Rates
Rates

Investigations on Electric Rates (Untersuchungen über Elektrizitätstarife). Carl Richter. Studies on the conditions accompanying the rate question and basic formulae for its determination. Diagrams. Serial. 1st part. 6000 w. Elek u Masch—Oct. 27, 1912. No. 37476 D.

Rates for Electricity. Henry D. Jackson. Considers fit and unfit business for lighting companies to secure and advises extensions along untried lines. 4000 w. Engineering Magazine—Dec., 1912. No. 37787 B.

Critical Tests on the Various Rate and Sale Systems for Electric Energy (Esame critico dei vari sistemi di tariffe di rendita dell' energia elettrica). G. Sartori. The peculiar elements entering into rate-making and suggestions for modifications. Serial. 1st part. 2000 w. Industria—Feb. 2, 1913. No. 40610 D.

The Theoretical Basis of the Multiple-Rate System. Hugo E. Eisenmenger. A plea for solid rates, and gives an interesting interpretation of rate bills based on solid geometry. Also editorial note. 5000 w. Elec Wld—May 24, 1913. No. 42391.

Rates and Rate Making. John F. Druar. A study of the valuation of a combined electrical and gas property for the purpose of determining the legitimate capital to be figured upon. 5000 w. Jour Assn of Engrg Soc—May, 1913. No. 42441 C.

Electricity Supply Charges. Information concerning systems of charging, with curves. 1800 w. Elec Rev, Lond—Aug. 1, 1913. No. 44306 A.

Current Rates in Austrian Electric Plants (Stromtarife in österreichische Elektrizitätswerken). L. Rosenbaum. A comparison of rates with other countries. Table. 2400 w. Elek u Masch—July 6, 1913. No. 44687 D.

See also Costs, under *Generating Stations*.

Reactance

The Use of Power Limiting Reactances in Large Power Stations. Cassius M. Davis. Shows how to determine the size of coil for given requirements and deals with the factors governing its use. 1800 w. Gen Elec Rev—June, 1913. No. 42583 C.

Reliability

The Means for Securing Reliability and Maintaining the Continuity of Supply. R. D. Spure. Discusses some causes of shut-downs. 2200 w. Elec Rev, Lond—March 14, 1913. No. 40805 A.

Investigation of Prospective Hydroelectric Power Service for Reliability. H. S. Knowlton. Considers points involved

GENERATING STATIONS**Turbine Plant**

in an investigation of service reliability. 2200 w. Eng News—May 22, 1913. No. 42352.

Stations

Electricity Developments in West Hartlepool. Illustrated description of the corporation waste heat generating station. 2000 w. Elec Rev, Lond—Aug. 1, 1913. No. 44305 A.

Combination Railway and Lighting System. J. C. Lathrop. Illustrated description of the Gorge power station of the Northern Ohio Traction & Light Co. of Akron, Ohio, located at Cuyahoga Falls. 4000 w. Elec Wld—Aug. 30, 1913. No. 44878.

Substations

Converting Substations in Basements and Sub-Basements. B. G. Jamieson. Treats principally of methods of overcoming the difficulties attendant upon the installation of synchronous converter and battery substations in basements. Ills. 3500 w. Pro Am Inst of Elec Engrs—July, 1913. No. 43344 F.

The Location of Electric Railway Substations. G. H. McKelway. Discusses factors to be considered in deciding the question. 3500 w. Engineering Magazine—Aug., 1913. No. 43917 B.

Automatic Substations. H. R. Summerhayes. Describes the automatic substation at Detroit, where a synchronous converter is installed, which is controlled from a distant station. Ills. 4500 w. Gen Elec Rev—Sept., 1913. No. 44833 C.

A Modern Substation in the Coeur d'Alene Mining District. John B. Fiske. Describes a typical mine substation built for supplying three-phase power at 2300 volts. Ills. 3000 w. Pro Am Inst of Elec Engrs—Sept., 1913. No. 45517 F.

Switchboards

An Interesting Design of Alternating-Current Switchboard. Illustrated description of a board for control of four-wire three-phase plant. 1500 w. Elec Rev & W Elect'n—March 1, 1913. No. 40253.

The Standard-Unit Switchboard. D. S. Morgan. Discusses the commercial factors that made the standard-unit board possible, and illustrates the working out of the scheme by solving the control requirements of three typical installations. Ills. 1500 w. Gen Elec Rev—March, 1913. No. 40251 C.

Installing a 12,000-Ampere Switchboard in an Isolated Plant. Illustrates and describes details of design and construction of an installation in Chicago. 1200 w. Elec Rev & W Elect'n—Aug. 16, 1913. No. 44412.

Turbine Plant

Lake Shore Generating Plant. A. D.

Consult Classification of the Index. See page 9.

Arc Lamps

LIGHTING

Cost

Williams. Illustrated description of the new turbine plant of the Cleveland Electric Illuminating Co. Deals with the plant in general in the present article. 1600 w. Power—March 18, 1913. Serial. 1st part. No. 40688.

See also Central Stations, under *Generating Stations*.

Turbine Station

The Waterside Turbine Station at Louisville, Ky. Illustrates and describes features of design and construction. 2500 w. Elec Wld—Oct. 25, 1913. Serial. 1st part. No. 46201.

Turin

The Municipal Electric Plant in Turin (Gli impianti elettrica municipali della città di Torino). Italo Bertoglio and Ugo Botto. The first part covers an historical outline of the municipal plant. Serial. 1st part. 2200 w. Industria—May 11, 1913. No. 42504 D.

Water-Wheels

Discussion on "Principles to be Considered in Selecting a Water-Wheel Unit." O. B. Coldwell. Portland, Ore., April 18, 1912. 6500 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38516 F.

LIGHTING

Arc Lamps

Characteristics of Magnetite Arc Lamps. A. G. Rakestraw. Discussion of the operation, illumination and application features. 1200 w. So Elect'n—Nov., 1912. No. 37658.

Enclosed Flame Arc Lamps. G. N. Chamberlin. Illustrated description of the design and construction and how difficulties in efficient operation were overcome. 1000 w. Gen Elec Rev—Nov., 1912. No. 37217 C.

Indirect Lighting by Arc Lamps. Justus Eck. Read before the Victorian Inst. of Elec. Engrs. Explains why indirect lighting is recommended, and why by arc lamps. Discusses the objections to such lighting, and illustrates and describes examples as applied to a number of industries. 6000 w. Aust Min Stand—Feb. 13, 1913. No. 40813 B.

Long Burning Flame Carbon Arc Lamps. G. W. Roosa. Illustrates and describes types and various applications. 2000 w. Elec Jour—June, 1913. No. 43225.

Aracs and Eletrodes. S. H. Blake and L. H. Couchey. Illustrated study of the characteristics of carbon arcs and the making of electrodes. 4000 w. Gen Elec Rev—July, 1913. No. 43327 C.

Recent Progress in Electrical Illumination by Arcs (Recenti progressi nella illuminazione elettrica ad arco). Guido Peri. Description of the new magnetite arcs, closed flames, etc., and their standards. Ills. Serial. 1st part. 2500 w. Industria—July 13, 1913. No. 43592 D.

Flame Carbon Arc Lamps. T. J. Pace. Illustrates and describes various forms of carbon arc lamps and their applications. 2200 w. Can Elec Assn—June, 1913. No. 44813 N.

See also Street, under *Lighting*.

Aracs

Stability of the Electric Arc. G. W. Roosa. A study of the electric arc, its sustaining power, properties affecting

stability, results produced by various forces, etc. Ills. 2800 w. Elec Jour—Dec., 1912. No. 38626.

Further Research on the Electric Arc as a Standard of Light. J. F. Forrest. Read before the British Assn. Report of research carried out in the electric engineering laboratory of the East London College. Ills. 1500 w. Elect'n, Lond—Sept. 26, 1913. No. 45729 A.

Carbon and Impregnated Electrodes for Arc Lamps. A. T. Baldwin. Discusses electrodes designed for modern street lighting. 5000 w. Elec Wld—Oct. 18, 1913. No. 45961.

The Conditions Under Which an Arc Light in Particular Can Not Be Produced (Ueber die Bedingungen, unter welchen ein Lichtbogen, überhaupt nicht entstehen kann) F. Kraus. The two conditions, current and arc-metal, non-productive of light, and experiments in proof thereof. Ills. Serial. 1st part. 2800 w. Elek u Masch—Aug. 24, 1913. No. 46073 D.

Automatic Plant.

An Automatic Electric Light Plant. The Lister-Bruston lighting set which starts and stops automatically. 1500 w. Engr, Lond—Feb. 28, 1913. No. 40493 A.

Bridges

The Electrical Work on a Large Public Bridge. Illustrates and describes the construction for outline lighting and general illumination of the Broadway bridge in Portland, Ore. 2000 w. Elec Rev & W Elect'n—Sept. 6, 1913. No. 45006.

Buildings

The Lighting of Public and Semi-Public Buildings. L. B. Marks. Considers the fundamental principles of the artificial illumination of interiors; the intensity as compared with daylight, and related subjects. 6500 w. Br Build—Sept., 1913. No. 45474 D.

Cost

Comparative Cost of Gas and Electric Lighting in Strassburg. Trans. from *Elektrotechnische Zeit*. Gives a compar-

Consult Classification of the Index. See page 9.

Distribution

ison showing that electric light is better and cheaper than gas. 1500 w. Elect'n, Lond—Oct. 17, 1913. No. 46226 A.

Distribution

A Rational Method of Showing Light Distribution. Robert French Pierce. Points out the misconceptions that a zonal-candle-power diagram may produce, and offers two polar diagrams by way of substitution. 1500 w. Elec Wld—Feb. 8, 1913. No. 39751.

Electric Lighting

Chemistry and Electric Lighting. Dr. O. Kruh. Abstract of articles in *Elektrotechnik und Maschinenbau*. Discusses the elements that have been tried to increase the efficiency. 2500 w. Elect'n, Lond—Nov. 29, 1912. No. 38115 A.

Europe

Electrical Service in European Cities. Dr. Louis Bell. Remarks on the wide use of tungsten and flame-arc lamps. 2500 w. Elec Wld—Sept. 27, 1913. No. 45493.

Factories

Modern Illumination for Industrial Plants. Harry C. Spillman. States results obtained with the Mazda lamps. Ills. 1200 w. Elec Rev & W Elect'n—Sept. 6, 1913. No. 45007.

Filaments

A Method of Spot-Testing Incandescent Filaments. C. F. Lorenz. Describes a method used in the laboratory of the Nat. Elec. Lamp Assn. Ills. 1500 w. Elec Wld—May 3, 1913. No. 41882.

The Process of Drawing Tungsten Wire (Ueber die Herstellung von gezogenen Wolframdraht). O. Kruh. An analysis of the properties of tungsten, its preparatory treatment, and drawing process. Ills. Serial. 1st part. 3200 w. Elek u Masch—April 13, 1913. No. 42160 D.

Head-Lamps

Theory, Design and Operation of Head-Lamps. Articles by Charles R. Sugg, A. R. Dennington, and L. C. Porter, covering the basic principles of the illumination relations of, the design of light, sources for, and the service performance of head-lamps. Ills. 4000 w. Elec Wld—Oct. 11, 1913. No. 45803.

Helium

Luminous Properties of Electrically Conducting Helium Gas. II. Reproducibility. P. G. Nutting. A report of tests, of interest in connection with the possible use of the helium tube as a primary photometric standard. 2500 w. Bu' Bureau of Stand—Nov. 1, 1912. No. 38663 N.

House Lighting

The Lighting of Small Country Houses.

LIGHTING

J. Caldwell. Gives comparative particulars of two typical installations of petrol gas and electric light. 1200 w. Elec Rev, Lond—April 18, 1913. No. 41751 A.

Illuminants

Efficiency of Illuminants. Charles P. Steinmetz. Deals with the relative importance of the various characteristics of an illuminant as affecting its suitability for different purposes. 2000 w. Gen Elec Rev—Nov., 1912. No. 37213 C.

Stroboscopic Effects Obtainable with Incandescent Filaments as Illuminants. C. F. Lorenz. Considers effects due to maximum flicker stimulus. Ills. 2000 w. Elec Wld—Nov. 30, 1912. No. 37950.

The Acetylene-Electric Flame. C. F. Lorenz. Describes experiments relating to electrically caused flame distortions, with an increase of luminosity that may be obtained by sending current through carbon-containing flames. Ills. 3000 w. Elec Wld—March 8, 1913. No. 40374.

Illumination

The Lighting of the Boston Electrical Show. Dr. Louis Bell. An illustrated article explaining some of the difficulties and how they were successfully overcome. 1800 w. Gen Elec Rev—Nov., 1912. No. 37215 C.

A Rational Method of Showing Light Distribution. R. F. Pierce. Diagrams and description of methods. 2000 w. Pro Age—Dec. 2, 1912. No. 38016.

Industrial Lighting. C. L. Eshleman. A discussion of artificial illumination showing that efficient illumination is necessary, that there are lighting units available, how they may be applied to produce desired results and the effects obtained from their use. Ills. 4000 w. Pro Am Inst. of Elec Engrs—Jan., 1913. No. 39360 F.

Discussion on "Industrial Illumination and the Average Performance of Lighting Systems," C. E. Clewell, and "The Problems of Interior Illumination," Bassett Jones, Jr., Boston, Mass., June 26, 1912. 9000 w. Pro Am Inst of Elec Engrs—Jan., 1913. No. 39361 F.

Illumination of Interiors. Preston S. Millar. Lecture before a joint meeting in N. Y. City. Discusses the requirements of the well qualified illuminating engineer, and his work. Ills. 8500 w. Gas Age—Jan. 1, 1913. No. 38705.

The Lighting of Picture Galleries and Museums. S. Hurst Seager. A critical discussion of methods of lighting, the principles governing the problem, etc. Ills. 10500 w. Jour Roy Inst of British Archts—Nov. 23, 1912. No. 38908 N.

The Electric Lighting of Villages. W. T. Wardale. Considers things essential

Illumination.

to success, and methods which ought to be adopted, illustrating different aspects of village lighting. 4500 w. *Elec Rev*, Lond—Jan. 10, 1913. No. 39246 A.

The Economic and Hygienic Value of Good Illumination. Leon Gaster. Shows its hygienic necessity, its desirability in preventing accidents, and on purely economic grounds; also discussion. Ills. 7000 w. *Jour Soc of Arts*—Feb. 7, 1913. No. 39902 A.

Hospital Illumination. Reports a discussion in Chicago at meeting of the Illuminating Engng. Soc. The subject was introduced by Meyer J. Sturm. 2500 w. *Elec Rev & W Elect'n*—March 22, 1913. No. 40775.

Studies of Recent Electric Luminescent Lamps. The Action of Extreme Red and Ultra-Violet on the Eyes (*Etude des nouvelles lampes électriques luminescentes. Action sur l'œil du rouge extrême et de l'ultraviolet*). MM. Broca, Jouast, de la Gorge and Laporte. Neon tubes, mercury quartz lamps, and their effects on visual acuity. 4200 w. *Bull Soc Int d'Electriciens*—Feb., 1913. No. 40582 F.

Relative Efficiency and Advantages of Direct, Semi-Direct and Indirect Lighting. L. Crouch. Gives test data comparing the efficiency, which favor semi-direct lighting. 1600 w. *Elec Rev*, Lond—March 21, 1913. No. 41000 A.

Electric Lighting in the Period from 1883 to 1913 (*Die elektrische Beleuchtung in der Zeit von 1883 bis 1913*). J. Sahulka. A review of the lines of development. 4000 w. *Elek u Masch (Special)*—March, 1913. No. 41491 D.

Effective Artificial Illumination. Edward R. Knowles. The need of studying each case by itself. 1000 w. *Am Archt*—April 30, 1913. No. 41805 C.

Dussaud's "Cold Light"—Its Remarkable Applications. Jacques Boyer. Illustrated description of the apparatus used and the uses for which it is adapted. 1000 w. *Sci Am*—May 31, 1913. No. 42521.

Measurement of Illumination. S. L. E. Rose and H. E. Mahan. Deals with the intensity, giving an outline of the requirements of an instrument for making the tests. Ills. 2000 w. *Gen Elec Rev*—May, 1913. No. 41817 C.

Contrast in Illumination. J. R. Cravath. Discusses the principles of comfortable lighting both natural and artificial. 2000 w. *Elec Wld*—June 7, 1913. No. 42730.

Some Tendencies in Electric Lighting. A survey of present tendencies of the lighting art. 4000 w. *Elec Rev & W Elect'n*—May 31, 1913. No. 42652.

Notes in Steel Mill Lighting. C. E.

LIGHTING.

Clewell. Describes points of interest in a large variety of locations investigated. Ills. 3000 w. *Elec Jour*—June, 1913. No. 43219.

Some Theoretical Considerations of Light Production. W. A. Darrah. Discusses the limitations of various electric illuminants now in use and the effect upon the progress of the art and upon future developments. 3000 w. *Ill Engng Soc*—Sept., 1913. No. 46368 N.

See also Shop Lighting, under MECHANICAL ENGINEERING, *Machine Works and Foundries*.

Incandescent Lamps

Automatic Current Regulation During Exhaustion of Incandescent Lamps. Describes an apparatus for the automatic switching in of the lamps when such a vacuum has been attained that the filament may be safely incandesced, and also the opening of the supply circuit. Ills. 2000 w. *Elec Rev*, Lond—Nov. 1, 1912. No. 37388 A.

Ignition of Gas by Standard Incandescent Lamps. H. H. Clark. A preliminary statement summarizing the results of tests. 600 w. *U S Bureau of Mines*—Tech paper 28. No. 38670 N.

Half-Frosted Incandescent Lamps. A. J. Makower and U. A. Oschwald. Brief report of requirements carried out to determine the variation in candle-power produced by frosting. 700 w. *Elect'n*, Lond—April 25, 1913. No. 41916 A.

The Problem of Life Testing Electric Incandescent Lamps. H. S. Dunning. Brief account of the testing work being done by manufacturers. 1200 w. *Elec Jour*—June, 1913. No. 43226.

I. Improvements in the Manufacture of Incandescent Lamps. B. F. Fisher, Jr. II. Increased Efficiencies of Mazda Lamps. J. Franklin Meyer. Deals particularly with the changes in Mazda lamps. 2000 w. *Elec Jour*—June, 1913. No. 43221.

Indirect

Some Interesting Installations of Indirect Lighting. Leonard V. James. Illustrates and describes recent improvements introduced in this system of lighting. 1000 w. *Elec Rev & W Elect'n*—Sept. 6, 1913. No. 45008.

Laboratory

The Illuminating Engineering Laboratory of the General Electric Company. S. L. E. Rose. Illustrated description of this laboratory and the work carried on, reviewing its development. 1200 w. *Ill Engng Soc*—Sept., 1913. No. 46363 N.

Lamps

Metal Filament Lamps. Alexander Siemens. Read before the Inst. of Met-

Lighting Comparisons

als. Reviews their development, stating the requirements they must meet. 1500 w. Mech Engr—March 21, 1913. No. 41008 A.

The Half-Watt Incandescent Electric Lamp. Sydney F. Walker. An explanatory letter giving information respecting the probable character of these lamps. 1500 w. Gas Wld—Sept. 13, 1913. No. 45279 A.

Report of the Committee on Progress. Reviews progress in incandescent electric lamps, arc lamps, vacuum tube lamps, gas lamps and appurtenances, acetylene, and other systems and subjects related. 11000 w. Ill Engng Soc—Sept., 1913. No. 46372 N.

Lighting Comparisons

The Economic Relation Between Gas and Electric Operation (Economische verhoudingen van gasbedrijven en electriciteitsbedrijven). F. Erens. A study of lighting costs under both systems. 5000 w. De Ingenieur—Dec. 28, 1912. No. 39061 D.

Magnetite

Magnetite Street Lighting. L. Burpee. Reviews the development of street lighting by electricity and the magnetite electrode. Ills. 3000 w. Can Elec Assn—June, 1913. No. 44699 N.

Mercury-Arc

Development of a New Quartz-Tube Mercury Arc Lamp. E. Weintraub. Illustrates and describes the development of a new type, explaining the beneficial results expected. 1500 w. Elec Wld—May 10, 1913. No. 41965.

Mercury Vapor

The Quartz Mercury Vapor Lamp. Illustrated detailed description. 1200 w. Ir & Coal Trds Rev—Dec. 6, 1912. No. 38255 A.

The Cooper Hewitt Quartz Tube Mercury Vapor Lamp. Joseph C. Pole. Illustrated detailed description. 1000 w. Elec Wld—Jan. 4, 1913. No. 38836.

The Possibility of Developing Mercury-Vapor Arc Rectifiers on the Basis of Experimental Research (Ueber die Entwicklungsmöglichkeit des Quecksilberhampf-Gleichrichters auf Grund experimenteller Untersuchungen) Wilb. Tschudy. Theoretical discussion. Diagrams. 7500 w. Elek Kraft u Bahnen—Feb. 4, 1913. No. 40564 D.

Theory of Mercury-Vapor Apparatus. Percy H. Thomas. Read before the New England Sec. of the Ill. Engng. Soc. The action of the Cooper Hewitt lamp construed on the basis of the election theory. 4000 w. Sci Am Sup—May 31, 1913. No. 42551.

The Mercury-Vapor Quartz Lamp.

LIGHTING

W. A. D. Evans. Explains the difference between the standard mercury-vapor tube lamps and the quartz lamps and gives data on the characteristics of quartz and also as to the construction of the burners. Ills. 5000 w. Ill Engng Soc—Sept., 1913. No. 46371 N.

Municipal Plant

A Successful Municipal Lighting Plant. Illustrated description of the plant at Crawfordsville, Ind. 3000 w. Munic Engng—Feb., 1913. No. 40095 C.

Municipal Lighting Plant of Troy, Ohio. L. A. Pool. Illustrated description, with financial statement. 2000 w. Munic Engng—March, 1913. No. 40880 C.

Pasadena Municipal Lighting Plant. Information concerning this electric light plant, the regulation of rates and related subjects. Ills. 4000 w. Munic Engng—June, 1913. No. 43178 C.

Nitrogen Lamp

The Nitrogen Filled Lamp. Information concerning the new nitrogen-filled tungsten lamp and the advantages. Ills. 2000 w. Gen Elec Rev—Oct., 1913. No. 45578 C.

I. Tungsten Lamps of High Efficiency. Irving Langmuir. Describes investigations into the cause of blackening of the bulbs and methods of preventing it. II. Tungsten Lamps of High Efficiency. Irving Langmuir and J. A. Orange. Describes in detail the high efficiency produced by filling the bulbs with nitrogen vapor. 10800 w. Pro Am Inst of Elec Engrs—Oct., 1913. No. 46338 F.

Panama Canal

See same heading, under CIVIL ENGINEERING, *Waterways and Harbors*.

Pentane Lamps

The Pentane Lamp as a Working Standard. E. C. Crittenden and A. H. Taylor. Recommends the use of tested pentane lamps as secondary standards of candle power when electric standards are not available. 7500 w. Ill Engng Soc—Sept., 1913. No. 46374 N.

Public Buildings

Hospital Lighting. William S. Kilmer. Treats of the lighting of the operating room and wards, and describes practical fixtures for the solution of the problems. Ills. 2000 w. Ill Engng Soc—Sept., 1913. No. 46376 N.

Experiments in the Illumination of a Sunday-School Room With Gas. Edwin F. Kingsbury. Describes some experiments in the illumination of the Sunday-school room of the Summit Presbyterian Church, of Germantown, Philadelphia. Ills. 2000 w. Ill Engng Soc—Sept., 1913. No. 46369 N.

Church Lighting. Robert B. Ely. Il-

Consult Classification of the Index. See page 9.

Public Buildings

Reflectors

Illustrated discussion of lighting systems in use. 4000 w. Ill Engng Soc—Sept., 1913. No. 46365 N.

The Requirements of Theater Lighting. S. L. E. Rose and H. E. Mahan. A description of the purpose and means of lighting the stage, auditorium and building exterior. Ills. 1500 w. Gen Elec Rev—Oct., 1913. No. 45588 C.

Quartz Lamps

The Cooper Hewitt Quartz Lamp. Joseph C. Pole. Illustrated detailed description of types and uses. 2000 w. Elec Jour—July, 1913. No. 43803.

Reflection

The Diffuse Reflecting Power of Various Substances. W. W. Coblentz. An account of an investigation of the reflecting power of matte surfaces of various substances. Ills. 140 pp. Bul Bureau of Stand—April 1, 1913. No. 43338 N.

Reflectors

An Investigation on Reflectors for Tungsten Lamps. A. L. Powell. A summary of results of investigations of various types of reflectors. Ills. 3500 w. Gen Elec Rev—Nov., 1912. No. 37218 C.

Investigation of Diffusing Glassware. M. Luckiesh. Describes a method for obtaining curves to show the diffusing properties, and some applications of the data. Also editorial. 2500 w. Elec Wld—Nov. 16, 1912. No. 37612.

The Diffuse Reflecting Power of Various Substances. W. W. Coblentz. An account of research work undertaken to establish methods for the production of standard absorbing surfaces from standard materials, and related problems. 9500 w. Jour Fr Inst—Nov., 1912. No. 37543 D.

Reflectors and Accessories for Lighting Inner Rooms with Metal Filament Lamps (Reflektoren und Armaturen für die Beleuchtung von Innenräumen mit Metalldrahtlampen). L. Bloch. Studies on the illuminating intensities of various reflectors. Ills. 2200 w. Elek u Masch—Oct. 13, 1912. No. 37474 D.

Reflectors for Metal Filament Lamps. Dr. L. Bloch. Abstract from *Elektrotechnik und Maschinenbau*. An examination of the devices used with a view to ascertaining whether improvement is possible. 1200 w. Elect'n, Lond—March 21, 1913. No. 41001 A.

Data Concerning Incandescent-Lamp Reflectors. G. H. Stickney and A. L. Powell. Gives facts and figures relating to the effectiveness and efficiency of various types. 3000 w. Elec Wld—Sept. 6, 1913. No. 45011.

Characteristics of Enclosing Glassware. Van Rensselaer Lansingh. A report of tests made on various kinds of

LIGHTING

glassware enclosing illuminants. Photometric curves and data are given. Ills. 2500 w. Ill Engng Soc—Sept., 1913. No. 46366 N.

Half-Frosted Lamps in Reflectors. W. T. Maccall. Reports experiments on such lamps. 500 w. Elect'n, Lond—Oct. 3, 1913. No. 45844 A.

Reflectors for Tungsten Lamps in Industrial and Office Lighting. A. L. Powell. A discussion of nature and application of designs, illumination secured and efficiency of reflectors. Ills. 4500 w. Elec Engng—Oct., 1913. No. 45696.

Shop Lighting

Factory Lighting. M. H. Flexner and A. O. Dicker. Aims to bring out the most important factors entering into the design of a lighting system for a factory. 3500 w. Ill Engng Soc—Sept., 1913. No. 46379 N.

Store Lighting

Distributive Store Lighting. Clarence L. Law and A. L. Powell. Describes in detail several typical installations, giving information of value to designing engineers. Ills. 4000 w. Ill Engng Soc—Sept., 1913. No. 46373 N.

Store Lighting. J. E. Philbrick. Outlines the gas-lighting installations of eight small stores. 2200 w. Ill Engng Soc—Sept., 1913. No. 46378 N.

The Lighting of Show Windows. H. B. Wheeler. Discusses the intensity required and the selection and placing of reflectors. Ills. 3000 w. Ill Engng Soc—Sept., 1913. No. 46362 N.

The Lighting of High Class Stores by the Indirect System. Harvey B. Wheeler. A study of the requirements for satisfactory illumination of stores by the indirect system. Ills. 1700 w. Elec Engng—Oct., 1913. No. 45697.

Street Lighting

Study of Relative Merits of the Various Types of Electric Arc and Incandescent Lamps for Lighting Urban and Suburban Streets. Harold H. C. Lasker. Prize essay. 5800 w. Stevens Ind—Jan., 1913. No. 39950 D.

Aesthetics in Street Lighting. George W. Roosa. Considers the most essential features, business streets, residential streets, and thinly populated districts. Ills. 2000 w. Elec Jour—Feb., 1913. No. 40154.

Electric Street-Lighting at Norwich. J. R. Dick. Illustrated description with statistics of the system installed. 3300 w. Elect'n, Lond—March 7, 1913. No. 40705 A.

Recent Developments in the Street Lighting of Manchester. S. L. Pearse and H. A. Ratcliff. Principally a record

Streets

of the work undertaken; the results obtained, and the tests and experiments upon which the satisfactory completion of the work depended. Ills. 9500 w. Inst. of Elec Engrs—March, 1913. No. 40702 N.

Standard Clauses for Inclusion in a Specification of Street Lighting. A. P. Trotter. Abstract of a paper before the Ill. Engng. Soc. States objections to the illumination basis, discusses horizontal, vertical or direct-ray measurements, etc. 6000 w. Elect'n, Lond—April 18, 1913. No. 41753 A.

Streets

The Advance in Street Lighting. Illustrated account of recent developments in ornamental street lighting, giving tabulated statistics of cost. 1600 w. Munic Engng—Nov., 1912. No. 37532 C.

Characteristic Ornamental Street Lighting. Illustrates and describes recent installations in various cities. 2500 w. Munic Engng—Nov., 1912. No. 37531 C.

Mazda Lamp Street Lighting. A. L. Chapin. Discusses the requirements for good street illumination, the characteristics and life of the mazda lamp, general practice, etc. Ills. 3000 w. Munic Jour—Nov. 7, 1912. No. 37325.

Street Lighting at Manchester, Eng. Reports upon flame arc lighting and high-pressure gas lighting. Also editorial. 9000 w. Elect'n, Lond—Nov. 1, 1912. No. 37391 A.

Reinforced Concrete Lighting Standards (Eisenbeton-Beleuchtungsmaste). Describes several types of ornamental street and private standards. Ills. 2000 w. Beton u Eisen—Oct. 2, 1912. No. 37428 E.

Electricity Versus Gas for Street Lighting. T. Osborne. A summary of tests made by H. T. Harrison and J. A. Body with comments and discussion of results. 2200 w. Elec Wld—Dec. 14, 1912. No. 38215.

Electric Development at the Coast. C. H. Fletcher. Illustrated account of street lighting in Vancouver. 1500 w. Can Elec News—Dec., 1912. No. 37977 C.

Tungsten Lamps for Street Lighting (Le lampade a tungsteno nella illuminazione stradale). Guido Peri. Discusses suitable reflectors and illuminating efficiency. Ills. Serial. 1st part. 2800 w. Industria—Dec. 1, 1912. No. 38496 D.

Illumination of Business Streets. G. W. Roosa. Discusses the advertising value of "white ways," and the principles of good illumination. Ills. 1200 w. Elec Jour—June, 1913. No. 43218.

The Street Lighting and Fixtures of the City of New York. C. F. Lacombe.

LIGHTING

Tungsten

Describes the plan of development and present conditions. Ills. 4000 w. Elec Jour—June, 1913. No. 43223.

City Street Lighting with Series Tungsten Lamps. G. H. Stickney. Enumerates the principal considerations necessary and gives valuable information. 3500 w. Gen Elec Rev—Sept., 1913. No. 44832 C.

The Lighting of Residence Streets. Alan Bright. General discussion, with illustrated descriptions of systems adopted in various cities. 1200 w. Elec Jour—Sept., 1913. No. 45097.

Park and Boulevard Lighting in Chicago. Illustrates and describes interesting features of the electrical equipment. 4000 w. Elec Rev & W Elect'n—Sept. 20, 1913. No. 45255.

Public Street Lighting in Chicago. Describes features in the development of the municipal electric street-lighting system. Ills. 4500 w. Elec Rev & W Elect'n—Sept. 6, 1913. No. 45005.

Some Interesting Construction for Street Illumination. Illustrated description of a system recently installed in Maryville, Mo. 2500 w. Elec Rev & W Elect'n—Sept. 13, 1913. No. 45114.

Intensified Lighting of Business Thoroughfares. Illustrates and describes installations and gives data on illumination and arrangement of units. 2500 w. Elec Wld—Sept. 6, 1913. No. 45009.

A Review of Recent progress in Outdoor Decorative Lighting. Alan Bright. Ills. 2500 w. Elec Engng—Oct., 1913. No. 45695.

Theatres.

Electric Theatre Installations. S. Burns. Abstract of paper read before the Manchester Students' Soc. of the Inst. of Elec. Engrs. Discusses the electrical equipment of the cinematograph theatre. 3500 w. Elect'n, Lond—March 7, 1913. No. 40704 A.

Theater Illumination. H. C. Harris. Discusses the suitability of various types of incandescent lamps and their arrangement. 2500 w. Elec Rev & W Elect'n—April 19, 1913. No. 41365.

Three-Phase

Electric Lighting and the Conversion of Three-Phase Into Single-Phase Currents of Triple Frequency. F. Spinelli. Trans. from *L'Elettricista*. Illustrated description of apparatus devised by the writer, capable of three simultaneous functions, and the solving of the problem. 1100 w. Elect'n, Lond—Oct. 25, 1912. No. 37289 A.

Tungsten

Notes on the Use of Tungsten Filament Lamps with Parabolic Reflectors.

Consult Classification of the Index. See page 9.

Tungsten Lamps

LIGHTING

Voltage Variations

G. H. Stickney. Considers how to obtain the best results. 2000 w. Gen Elec Rev—Dec., 1912. No. 38000 C.

Tungsten Lighting in Modern Industrial Establishments. Alex. J. Airston. Discusses the fundamental requirements of tungsten lighting installations. Ills. 2000 w. Elec Jour—Dec., 1912. No. 38627

The Wolfram Lamp and Its Development, Especially the Latest Improvement (Die Wolframlampe und ihre Entwicklung unter Berücksichtigung der letzten Verbesserungen). A. Lederer. Historical review with details concerning the osmium filament. Ills. 3200 w. Elek u Masch—Dec. 29, 1912. No. 39054 D.

On the Deviation from Lambert's Cosine Law of the Emission from Tungsten and Carbon at Glowing Temperatures. A. G. Worthing. Abstract of a paper before the Am. Phys. Soc. Deals with the comparative brightness of tungsten and carbon. 1500 w. Elec Rev & W. Elect'n—April 5, 1913. No. 41105.

The Rating and Life of Tungsten Filament Lamps. Editorial review of a report of experiments and results on the rating and life of tungsten lamps. 2000 w. Engng—May 30, 1913. No. 42784 A.

The Drawn Tungsten Filament. Dr. O. Kruh. Abstract translated from *Elektrotechnik und Maschinenbau*. An account of methods employed in preparing the tungsten filament, the improvements to the process and recent patents. 3000 w. Elect'n, Lond—Aug. 29, 1913. No. 45030 A.

See also same heading, under MECHANICAL ENGINEERING, *Materials of Construction*.

Tungsten Lamps.

Electric Sign Lighting with Tungsten Lamps. O. P. Anderson. Information for utilizing the new lamps to the best advantage electrically. Ills. 3500 w. Gen Elec Rev—March, 1913. No. 40248 C.

The Osram Lamp of Wire-Drawn Tungsten (La lampada Osram di tungsteno trafilato). H. Remané. Description of the various stages of manufacture, and commercial uses. Ills. 2100 w. Industria—June 22, 1913. No. 43590 D.

The Use of Tungsten Lamps in Electric Signs. O. P. Anderson. Discussion of the economical operation and arrangement of different sizes of lamps. 2000 w. Elec Engng—Aug., 1913. No. 44292.

The Cooling Effect of Leading-In Wires Upon the Filaments of Tungsten Incandescent Lamps of the Street Series Type.

T. H. Amrine. Report of a study and experimental results. Ills. 3500 w. Ill Engng Soc—Sept., 1913. No. 46367 N.

See also Nitrogen Lamps, and Reflectors under *Lighting*.

Vacuum Tubes

On the Deduction of Wien's Displacement Law. E. Buckingham. Gives a simplified deduction related only to radiation in vacuo. 3500 w. Bul Bureau of Stand—Nov. 1, 1912. No. 38666 N.

Wave-Lengths of Neon. Irwin G. Priest. A report of research work with a summary of results. 1500 w. Bul Bureau of Stand—Nov. 1, 1912. No. 38665 N.

Vapor Lamps.

The Characteristics of Vapor Lamps. A. G. Rakestraw. Considers light sources in which the conducting medium is a gas or vapor. Ills. 1800 w. So Elect'n—March, 1913. No. 40650.

Visual Acuity

Vision and the Measurement of Light and Illumination. Elihu Thomson. Discusses the theory of vision and the ability of the human eye to perceive color contrasts; and considers illumination measurement. 3500 w. Gen Elec Rev—Nov., 1912. No. 37214 C.

Experimental Tests to Determine the Effect of a Colored Background Upon Visual Perception. Sydney W. Ashe. A study of acuity. Ills. 2000 w. Gen Elec Rev—April, 1913. No. 40992 C.

Radiant Energy and the Eye. M. Luckiesh. Discusses the possible effect on the eye of the absorption of energy other than luminous. Also editorial. 3000 w. Elec Wld—Oct. 25, 1913. No. 46203.

The Efficiency of the Eye Under Different Systems of Illumination—The Effect of Variations in Distribution and Intensity. C. E. Ferree. An investigation of the effect of variations in the distribution of light on the efficiency of the eye for a period of work. 4500 w. Ill Engng Soc—Sept., 1913. No. 46364 N.

Visual Effects

Is the Electric Light Harmful to the Eyes (Ist das elektrische Licht für die Augen schädlich)? Fritz Kesseling. Studies on the visual effects from electric-light waves. 2500 w. Elek Rund—Oct. 10, 1912. No. 37477 D.

Voltage Variation

Causes of Voltage Variation in the Operation of Lighting Systems. J. J. Sullivan. States the causes of unsatisfactory voltage supply and points out the sources of trouble. 1200 w. Gen Elec Rev—Aug., 1913. No. 44091 C.

Consult Classification of the Index. See page 9.

Winch

Winch

The "Jandus" Winch. Illustrated description of an ingenious winch, handy for raising and lowering arc lamps wherever situated. 700 w. Engng—June 20 1913. No. 43389 A.

MEASUREMENT

Heat Measurements

Wiring

The Wiring of Shop Buildings of Steel Construction. Ernest G. Bradshaw. Illustrates and describes methods which have given excellent results. 3000 w. So Elect'n—Dec., 1912. No. 38162.

MEASUREMENT

Alternating Current

The Use of the Synchronous Commutator in Alternating Current Measurements. Frederick Bedell. An explanation of the possibilities of the rectifying or integrating commutator. Ills. 5500 w. Jour Fr Inst—Oct., 1913. No. 46316 D.

Amperes

A Determination of the International Ampere in Absolute Measure. E. B. Rosa, N. E. Dorsey, and J. M. Miller. Explains the relation of absolute to international units, recent absolute measurements of current, types of instruments and the Rayleigh balance, its theory, etc. Ills. 40000 w. Bul Bureau of Stand—June 15, 1912. No. 38658 N.

Apparatus Testing

The Desirability of Revising the Rating and Methods of Testing Electrical Apparatus. Benjamin G. Lamme. The desirability of revising the rules of the American Institute of Electrical Engineers is considered briefly. General discussion. 9000 w. Jour W Soc of Engrs—April, 1913. No. 42362 D.

Appliances

See Electrical Progress, under *Power Applications*.

Cartography

Report on Cartography (Rapport sur la cartographie). Suggested system of graphical symbols applicable to electrical installations. Report, presented to the Société Internationale des Electriciens. Ills. 3500 w. Bull Soc Int d Elec—Mar., 1913. No. 41513 F.

Charts

A Multiplying Chart for the Graphical Analysis of Curves into Their Component Harmonics. H. Rottenburg. Describes a method for analyzing curves having a number of features to recommend it. 1000 w. Elect'n. Lond—March 28, 1913. No. 41132 A.

Conductivities

An Electrical Method for Comparing Thermal Conductivities. William Eves, 3rd. Describes this method. 1500 w. Met & Chem Engng—Sept., 1913. No. 44970 C.

Dynamometer

Expanding Armature Absorption Dyn-

amometer. Illustrated description of a new form of disc absorption dynamometer. 700 w. Engng—July 18, 1913. No. 43966 A.

Efficiency

Sources of Error in the Efficiency Determination of Rotating Electric Machines. Elmer I. Chute and William Bradshaw. Treats of the sources and effects of errors. 2200 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40213 F.

Electrical Instruments

The Use of Iron in Electrical Measuring Instruments. Dr. M. Dolivo-Dobrowolsky. Abstract from *Elektrotechnische Zeit*. A study of problems connected with the general design of measuring instruments. 2000 w. Elect'n, Lond—May 23, 1913. No. 42742 A.

Electro-Dynamometers

The Carpentier Sensitive Electro-Dynamometer with Multiple Functions (Électrodynamomètres J. Carpentier à sensibilités et à fonctions multiples). L. Joly. Detailed description of this universal metering apparatus. Ills. 4200 w. Bull Soc Int d Electriciens—Dec., 1912. No. 39078 F.

A Tubular Electrodynamometer for Heavy Currents. P. G. Agnew. Explains the theory of the instrument, its construction and performance. 1500 w. Bul Bureau of Stand—March 1, 1913. No. 42928 N.

Electrometers

Modern Electrometers. E. N. da C. Andrade. Describes types and recent improvements introduced. Ills. 1600 w. Nature—Oct. 2, 1913. No. 45830 A.

Flow Meters

Flow Meters, Their Applications and Relations to Increased Production and Higher Efficiencies. James Wilkinson. Gives the benefits to be derived from the use of the meter, describes its working and gives information related. Ills. 1500 w. Gen Elec Rev—Oct., 1913. No. 45584 C.

Heat Measurements

Discussion on Group I Papers (Heating, Heat Measurements, Rating by Heat), New York, Feb. 26, 1913. 18500 w. Pro Am Inst of Elec Engrs—Sept., 1913. No. 45520 F.

Consult Classification of the Index. See page 9.

High Voltage

High Voltage

The Sphere Gap as a Means of Measuring High Voltage. F. W. Peck, Jr. Shows that by using spheres for the electrodes of spark gaps much more consistent results are obtained. 1800 w. Gen Elec Rev—May, 1913. No. 41809 C.

Hyperbolic Functions

Hyperbolic Functions and Their Application to Problems in Electrical Engineering. J. H. Morecroft. A review of a lecture by Dr. A. E. Kennelly explaining the value of hyperbolic trigonometry in solving problems in electrical engineering. 3500 w. Sch of Mines Qr—April, 1913. No. 41694 D.

Illumination

Graphic Solution for Illumination Problems. Neville S. Dickinson. Gives a chart for rapid calculation of illumination density from known values of candle power and of vertical and horizontal distances from the source. 2500 w. Elec Wld—Sept. 20, 1913. No. 45257.

Indicators.

The Installation of Power-Factor Indicators. Leonard Murphy. Explains the value of these instruments and the correct method of using them. Ills. 3000 w. Elec Rev, Lond—March 14, 1913. No. 40804 A.

Inductance

The Measurement of the Inductances of Resistance Coils. Frederick W. Grover and Harvey L. Curtis. Treats of the measurement of the effective inductance of "noninductive" resistance coils and multipliers for use in alternating current bridges and in potential circuits when it is desired to know the phase angle. 9800 w. Bul Bureau of Stand—Nov. 1, 1912. No. 38662 N.

The Four-Terminal Conductor and the Thomson Bridge. Frank Wenner. Points out the conditions which must be fulfilled in order that both resistance and inductance be definite, and discusses points to be observed in the design of low-resistance standards to carry large currents. 17500 w. Bul Bureau of Stand—Nov. 1, 1912. No. 38667 N.

Instrument Testing

Instrument Testing Methods and Equipment for Central Stations. E. P. Peck. Describes the potentiometer, its use in checking ammeters and voltmeters, etc. 2000 w. So Elect'n—Nov., 1912. No. 37657.

Insulator Testing

(1) Suggested Specifications for Testing High-Voltage Suspension Insulators. F. W. Peck, Jr. (2) Suggested Specifications for Testing High-Voltage Insulators. J. A. Sandford, Jr. (3) Insulator

MEASUREMENT

Testing Specifications for Insulators Having an Operating Voltage Exceeding 25000 Volts. Percy H. Thomas. 7500 w. Pro Am Inst of Elec Engrs—July, 1913. No. 43346 F.

Irregularity

An Apparatus for Measuring the Irregularity of A. C. Generating Sets (Sur un appareil pour la mesure de l'irrégularité des groupes électrogènes à courant alternatif). M. Boucherot. Describes the apparatus known as the "Galvanoscilla." Ills. 3800 w. Bull Soc Int des Electriciens—Nov., 1912. No. 39063 F.

Kinematography.

Kinematographic Recording of Ballistic and Physical Phenomena with the Aid of the Direct-Current Quenched-Spark Gap. C. Cranz and B. Glotzel. Abbreviated translation from the German. Describes the method developed and results. Ills. 2000 w. Elect'n, Lond—Feb. 28, 1913. No. 40466 A.

Laboratory

The Physical Laboratory of the National Electric Lamp Association. Edward P. Hyde. A résumé of the activities of the laboratory in the development of the modern science of illumination. 6000 w. Jour Fr Inst—July, 1913. No. 44031 D.

Light Standard

The Electric Arc as a Standard of Light. J. F. Forrest. Describes methods by which it was sought to obtain a workable standard of light. Finally satisfactory results were obtained with two negatives and one positive. 3000 w. Elect'n, Lond—Aug. 8, 1913. No. 44448 A.

Load Tests

Notes on Methods of Making Load Tests on Large Induction Motors. A. M. Dudley. Gives a description of methods ordinarily employed, and reasons for making compromise temperature tests, concluding that they are desirable and necessary. 2200 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40210 F.

Comparison of Methods of Making Load Tests on A.-C. Generators and on Induction Motors. E. F. Collins and W. E. Holcombe. Outlines some of the more practical methods that have been employed for obtaining the running temperature under no-load or partial-load conditions. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40179 F.

Machine Tests

Notes on the Testing of Electrical Machinery. Describes the method of carrying out complete performance tests. Ills. 3500 w. Mech Wld—Aug. 29, 1913. Serial, 1st part. No. 45037 A.

Magnetic Fields**Magnetic Fields**

The Measurement of Magnetic Fields. P. H. S. Kempton. Considers the magnitude of magnetic, electrical, and optical effects and their application to measurement of strengths. 1700 w. Elec Rev, Lond—Dec. 13, 1912. No. 38385.

Magnetic Observatory

The New Recording Declinometer for the Lower Rhine-Westphalian Coal District (Das neue selbstschreibende Deklinatorium für den niederrheinisch-westfälischen Steinkohlenbezirk). L. Mintrop. Describes new automatic recorder, and its results. Ills. 4500 w. Glückauf—Dec. 21, 1912. No. 39007 D.

Magnetism

A Direct Method of Measuring Magnetic Susceptibility, and an Instrument for this Purpose. W. H. F. Murdoch. Read before the British Assn. Explains the magnetometer method and its advantages. 1000 w. Elect'n, Lond—Sept. 19, 1913. No. 45561 A.

Meter Installations

Back-Porch Meter Installations. Illustrates and describes installations in small towns and villages, explaining their convenience. 1500 w. Elec Wld—May 3, 1913. No. 41883.

Meters

A New Method of Timing Watt-Hour Meters. Gordon Thompson. Describes the method and apparatus. 2500 w. Elec Wld—Feb. 1, 1913. No. 39638.

Description of Some New Weston Metering Instruments (Description de quelques Nouveaux Instruments de Mesure Weston). Paul Samuel. The description covers volt and amperemeters, monophase and polyphase wattmeters, synchroscopes, power-factor indicators and frequency meters. Ills. 10,000 w. Soc Belge d'Elec—April, 1913. No. 43056 E.

Weston Meters for Uses in Central Stations (Weston-Meetinstrumente voor het gebruik in elektrische centrales). A. W. Souman. Describes these wattmeters, synchroscopes, frequency meters, etc. Ills. 5400 w. De Ingenieur—June 21, 1913. No. 43548 D.

Electric Meters (I contatori elettrici). Emilio Biffi. A study of the principles underlying the action of the five main groups of electric meters. Ills. Serial. 1st part. 4800 w. Monit Tec—June 30, 1913. No. 43588 D.

Graphic Meters. G. D. Gratton. A review of the experiences and methods followed by the Canadian Electric Power Co., Ltd., describing these meters, their performance, etc. Ills. 6000 w. Can Elec Assn—June, 1913. No. 44816 N.

An Electrical Measuring Machine. P.

MEASUREMENT

E. Shaw. Describes a new machine founded on the electric contact principle. Ills. 9500 w. Inst of Mech Engrs—July, 1913. No. 44762 N.

Nomograms

Nomograms for Electrical Problems. M. J. Eichhorn. Gives a nomogram for size of generator leads, a nomogram for size of wire for d. c. transmission, and a nomogram for power factor of three-phase circuits, with explanations. 1000 w. Elec Rev & W Elect'n—March 1, 1913. No. 40254.

Permeability

Discussion on "Permeability Measurements with Alternating Current" (Robinson and Ball), and "Measurements of Maximum Values in High Voltage Testing" (Sharp and Farmer), Boston, Mass., June 28, 1912. 6500 w. Pro Am Inst of Elec Engrs—Jan., 1913. No. 39363 F.

Photometry

Interpretation of Photometric Curves. G. H. Stickney. Points out ways in which photometric curves may be interpreted for practical purposes, and suggests errors likely to be encountered. 2500 w. Gen Elec Rev—Nov., 1912. No. 37219 C.

Elimination of Color Differences in the Photometry of Incandescent Lamps by Means of Multi-Voltage Standards. Davis H. Tuck. Outlines a procedure for the comparison of lamps operating at different colors. 1000 w. Elec Rev, Lond—Nov. 15, 1912. No. 37805 A.

A Precision Photometer Bench and Accessories. Edward P. Hyde and F. E. Cady. Illustrated description of a photometer bench and apparatus. 1500 w. Elec Rev & W Elect'n—Nov. 16, 1912. No. 37596.

Application of the Selenium Cell to Photometry. A. H. Pfund. Abstract from *Phys. Rev.* Interesting account of an attempt to use selenium for this purpose. 1800 w. Elect'n, Lond—Dec. 6, 1912. No. 38235 A.

A New Differential Watt-per-Candle Meter. Edward P. Hyde. Explains the principle of the new method and its application. 2500 w. Elec Rev & W Elect'n—Feb. 1, 1913. No. 39643.

The Purkinje Effect and Comparison of Flicker and Equality-of-Brightness Photometers. M. Luckiesh. Reports results of tests made at the Physical Laboratory, Cleveland, O. 1600 w. Elec Wld—March 22, 1913. No. 40779.

Some Difficulties in the Photometry of Luminous Sources. (Quelques difficultés de la photométrie des sources lumineuses industrielles) MM. Broca and Laporte. The necessity of employing sim-

Photometry

Potentiometers

ple methods in comparing very different light sources. 2800 w. Bull Soc Int d'Electriciens—Feb., 1913. No. 40583 F.

Silvered Mirrors and Their Preservation. Dr. Louis Bell. Discusses the preservation of mirrors used in photometric laboratories. 1500 w. Elec Wld—May 24, 1913. No. 42390.

Some Studies in Accuracy of Photometry. Evan J. Evans and Ward Harrison. Reviews the more important investigations, reporting five separate studies. 2500 w. Ill Engng Soc—Sept., 1913. No. 46377 N.

The Photo Electric Cell in Photometry. F. K. Richtmyer. Discusses its possibilities for photometric use, pointing out some of its characteristics, peculiarities, and advantages. 2200 w. Ill Engng Soc—Sept., 1913. No. 46370 N.

Potentiometers

Outline of Design of Deflection Potentiometers, with Notes on the Design of Moving-Coil Galvanometers. H. B. Brooks. Outlines the principles on which deflection potentiometers are designed. 8500 w. Bul Bureau of Stand—June 15, 1912. No. 38660 N.

Deflection Potentiometers for Current and Voltage Measurements. H. B. Brooks. Gives a description of two recent forms of deflection potentiometers which are quite similar in design, explaining the theory of the use of current shunts and the most suitable values for such shunts. 6000 w. Bul Bureau of Stand—June 15, 1912. No. 38659 N.

The Use of the Alternate-Current Potentiometers for Measurements on Telegraph and Telephone Circuits. C. V. Drysdale. Drawings and description of the instrument and its applications. 2200 w. Elect'n, Lond—Aug. 1, 1913. No. 44307 A.

Power Losses

Small Alternating - Current Power Measurements. J. T. Irwin. Describes a method which gave satisfactory results. 1000 w. Elect'n, Lond—Feb. 7, 1913. No. 39906 A.

Power Measurement

The Use of the Electrostatic System for the Measurement of Power. C. C. Paterson, E. H. Rayner, and A. Kinnes. Describes the electrostatic instruments now used at the National Physical Laboratory for the measurement of alternating currents, pressure, and power. 11's. 1200 w. Inst of Elec Engrs—May 1, 1913. No. 41996 N.

Pyrometry

Recent Progress in Industrial Pyrometry. Charles R. Darling. Illustrates and describes thermo-electric pyrometers,

MEASUREMENT

Synchronism Indicators

resistance pyrometers, radiation and optical pyrometers. 3500 w. Engr, Lond—June 13, 1913. No. 43146 A.

Radiometer

An Improved Joule Radiometer and Its Applications. F. W. Jordan. Abstract of a paper read before the Physical Soc. Describes apparatus designed to eliminate the necessity for elaborate insulation and to give a steady zero and a fairly high sensibility. 1000 w. Elect'n, Lond—Jan. 10, 1913. No. 39248 A.

Rating

Method of Rating Electrical Apparatus. W. L. Merrill, W. H. Powell, and Charles Robbins. Submits suggestions for a standard of rating. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40175 F.

See Temperature, under Measurement.

Resistance

Measuring Currents in Underground Structures. Carl Hering. Describes a practical method for measuring the resistance of parts underground, for the purpose of measuring the currents in them with a millivoltmeter. 4500 w. Elec Ry Jour—Oct. 11, 1913. No. 45882.

Rheostat

A New Loading Rheostat. H. H. Broughton. Illustrates and describes an inexpensive loading rheostat, built upon the interchangeable unit system, for use in test rooms and engineering laboratories. 800 w. Elect'n, Lond—Aug. 15, 1913. No. 44714 A.

Shop Testing

Shop Testing of Electrical Apparatus. First of a series of articles describing, in detail, present day practice in testing various types of electrical apparatus. 11's. 4500 w. Elec Jour—Jan., 1913. Serial. 1st part. No. 39441.

Standardization

Standardization of Electric Equipment. Gives rules drafted by the Am. Min. Cong. Committee to promote safety, economy, and efficiency in the methods of installing and operating underground electrical equipment in metal mines. 2500 w. Eng & Min Jour—April 5, 1913. No. 41112.

Stray Currents

Discussion on "Measuring Stray Currents in Underground Pipes." Carl Hering. At Boston, Mass., June 28, 1912. 7000 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38515 F.

See also Corrosion, under Electro-Chemistry.

Synchronism Indicators

The Operation and Installation of Switchboard Synchronism Indicators. J. A. Haraden. Explains the principles of

Consult Classification of the Index. See page 9.

Temperature

operation and briefly describes its construction. Ills. 1000 w. Gen Elec Rev—April, 1913. No. 40993 C.

Temperature

Method of Determining Temperature of Alternating Current Generators and Motors and Room Temperature. Henry G. Reist and T. S. Eden. Calls attention to various methods of determining temperature of Apparatus, giving recommendations. 2000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40181 F.

The Temperature Rise of a Stationary Induction Apparatus as Influenced by the Effects of Temperature, Barometric Pressure and Humidity of the Cooling Medium. J. J. Frank and W. O. Dwyer. A theoretical résumé of the considerations, with the results of an investigation made to verify the conclusions. 4500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40191 F.

Measurement of Temperature in Rotating Electric Machines. L. W. Chubb, E. I. Chute, and O. W. A. Oetting. Discusses the advantages and disadvantages of standard and special methods of measuring temperatures. 4000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40207 F.

Effect of Air Temperature, Barometric Pressure and Humidity on the Temperature Rise of Electric Apparatus. C. E. Skinner, L. W. Chubb, and Phillips Thomas. Discusses heat dissipation and points out that it is not only copper resistance changes which offset temperature rise, but also variations in other internal losses and heat dissipation. Ills. 1800 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40204 F.

Effect of Room Temperature on Rise of Motors and Generators. Maxwell W. Day and R. A. Beekman. Gives results of special tests on motors and generators for the purpose of obtaining data. 4500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40196 F.

A Laboratory Investigation of Temperature Rise as a Function of Atmospheric Conditions. C. R. Blanchard and C. T. Anderson. A report of laboratory tests made to determine the effect of pressure, temperature and humidity of the air surrounding a heat dissipating body. 2000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40199 F.

Comparison of Methods of Loading Large A.-C. and D.-C. Generators and Synchronous Converters for Factory Temperature Tests. F. D. Newbury. Describes and illustrates four methods and discusses the relative merits. 4000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40214 F.

MEASUREMENT

Thermocouples and Resistance Coils for the Determination of Local Temperatures in Electrical Machines. J. A. Capp and L. T. Robinson. Discusses different devices for measuring temperatures in electrical machines, pointing out their sources of error and limitations. 2000 w. Pro Am Inst of Elec Engrs—March, 1913. No. 40440 F.

Discussion on "Temperature and Electrical Insulation" (Steinmetz and Lamme) and "Method of Rating Electrical Apparatus" (Merrill, Powell and Robbins). New York, Feb. 26, 1913. 25000 w. Pro Am Inst of Elec Engrs—Aug., 1913. No. 44742 F.

Correction on Transformer Temperatures for Variation in Room Temperature, Taking Into Account Both Copper and Iron Losses. C. Fortescue. Derives formulae for obtaining the corrected temperature rise. 1800 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40209 F.

Methods of Determining Temperature of Transformers. W. M. McConahey and C. Fortescue. A brief discussion of conditions that affect the operating temperature of transformers and the relative merits of different methods of measuring temperatures. 2500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40201 F.

Methods of Determining Temperature of Transformers and of Cooling Medium. S. E. Johannesen and G. W. Wade. Discusses methods of determining the effective temperature of the cooling medium and the actual temperature of heated transformers. 5500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40184 F.

Testing Apparatus

High Voltage Testing and Testing Apparatus. F. C. Loring. Illustrated description of the testing equipment and methods of the University of Illinois. 2000 w. Elec Rev & W Elect'n—July 19, 1913. No. 43833.

Testing Plants

Laboratory and Testing Plant of the New Cable Shop of the Siemens-Schuckert Works (Die Laboratorien und Prüfarbeiten des neuen kabelwerkes der Siemens-Schuckert-Werke). Leon Lichtenstein. The ground plans and testing machinery installed. Ills. 7000 w. Elek Kraft u Bahnen—June 4, 1913. No. 43049 D.

Tests

Inspection and Tests on Electrical Machinery. Hugh T. Wrecks and R. L. Shearer. The present number deals with factory tests on direct current generators and motors. 2500 w. Elec Engng—June, 1913. Serial, 1st part. No. 42726.

Torque.

Signification of Torque. Franklin Van

Consult Classification of the Index. See page 9.

Transformer Tests

Winkle. Describes the method of measuring the torque of a motor and defines the relation of torque to horsepower and kilowatt. 1200 w. *Power*—March 4, 1913. No. 40302.

Transformer Tests

Sources of Error in Transformer Tests. W. M. McConahey and C. Fortescue. Enumerates the ordinary tests made on transformers and considers each separately. 2000 w. *Pro Am Inst of Elec Engrs*—Feb., 1913. No. 40206 F.

Load Tests on Transformers. J. J. K. Madden. Discusses methods of conducting load tests on more than one transformer without making such tests where one single phase transformer only is available. 2500 w. *Pro Am Inst of Elec Engrs*—Feb., 1913. No. 40190 F.

Units

The Myriawatt as a Unit of Electric Power. Discussions by William Kent and by George H. Barrus. 6000 w. *Jour Am Soc of Mech Engrs*—May, 1913. No. 42405 D.

Discussion on "The Myriawatt" (Stott and O'Neill), Boston, Mass., June 26, 1912, and New York, Feb. 27, 1913. 3000 w. *Pro Am Inst of Elec Engrs*—Aug., 1913. No. 44743 F.

The Myriawatt as a Unit of Power. Continued discussion of the paper by H. G. Stott and Haylett O'Neill. 3500 w. *Jour Am Soc of Mech Engrs*—Aug., 1913. No. 44513 D.

Voltage

Method of Testing Electrical Insulations, and the effect of Variables on Disruption Voltage. M. E. Tressler. Considers only the electrical testing of insulation materials. 4500 w. *Gen Elec Rev*—March, 1913. No. 40245 C.

See also Permeability, under *Measurement*.

Voltmeter

The Silver Voltmeter. E. B. Rosa

POWER APPLICATIONS**Agriculture**

and G. W. Vinal. Gives brief history of investigations on the silver voltmeter, outline of the work, experiments and conclusions. Also the chemistry of the filter paper voltmeter and the explanation of striations. Ills. 131 pp. *Bul Bureau of Stand*—April 1, 1913. No. 43337 N.

The Silver Voltmeter. E. B. Rosa and G. W. Vinal. First two of a series of articles on experimental researches, with historical review of the subject up to 1909. Also editorial note. 4000 w. *Elec Wld*—Dec. 14, 1912. Serial. 1st part. No. 38213.

The Silver Voltmeter—Part III. E. B. Rosa, G. W. Vinal and A. S. McDaniel. Second series of quantitative experiments and the preparation and testing of silver nitrate. 14000 w. *U S Bureau of Stand*, No. 201—Jan. 1, 1913. No. 45547 N.

Voltmeters

The Calibration of Sphere Gap Voltmeter. S. W. Chubb and C. Fortescue. Presents calibration curves for the three sizes of sphere gaps which have been suggested as standards. Ills. 2000 w. *Pro Am Inst of Elec Engrs*—Feb., 1913. No. 40211 F.

Wattmeters

Integrating Wattmeters with Recording Attachments. H. S. Baker. Describes a form of integrating demand meter which graphically registers integrations of power during one minute or greater intervals. 1600 w. *Can Elec Assn*—June, 1913. No. 44815 N.

Wind Velocity

The Distribution of Wind Velocity in the Space Surrounding a Circular Rod in a Uniform Current of Air. J. T. Morris. Gives experimental work showing that the electrical method of measuring wind velocity is reasonably accurate. Diagrams. 2500 w. *Engng*—Aug. 8, 1913. No. 44462 A.

POWER APPLICATIONS**Agriculture**

Electricity on the Farm. Illustrates and describes details of typical installations. 1500 w. *Elec Rev & W Elect'n*—April 5, 1913. No. 41103.

Agriculture, Electricity and Irrigation. Putnam A. Bates. Illustrated description of how intensive farming is made possible with the electrically driven pump. 1800 w. *Sci Am*—May 24, 1913. No. 42313.

Electricity and Vegetation: Electro-culture (*L'électricité et la végétation: L'électroculture*). Jean Escard. The use of atmospheric and artificial electric cur-

rents and probable influence in agriculture. Ills. 5400 w. *Rev Gen des Sciences*—April 30, 1913. No. 42180 D.

Electricity on the Farm. John C. Parker. Discusses some of the difficulties in the way of farm extension. 3500 w. *Can Elec Assn*—June, 1913. No. 44698 N.

How Much Electricity Does the Average Farmer Use? C. J. Rohrer. Gives statistics relative to the power requirements of the farmers of the United States and tabulated data from 130 farms supplied with power. 2500 w. *Gen Elec Rev*—Oct., 1913. No. 45582 C.

Consult Classification of the Index. See page 9.

Book-Binding**POWER APPLICATIONS****Electrical Progress****Book-Binding**

Electricity in Book-Binding Plants. Illustrates and describes the application of electric motors to bindery machinery, discussing the power requirements and advantages and giving operating data. 2500 w. Elec Rev & W Elect'n—June 28, 1913. No. 43315.

Breweries

The Electrical Equipment of a Brewery. V. V. Newell. Brief illustrated description of a plant in Macon, Ga. 1000 w. Elec Wld—Nov. 23, 1912. No. 37772.

Building Equipment

Electrical Equipment in Lytton Building. Illustrates and describes the engine-room apparatus, refrigerating system, lighting installation, and telephone and signal systems in an 18-story structure in Chicago. 2500 w. Elec Wld—July 5, 1913. No. 43473.

Buildings

The High-Potential Service in Commercial Buildings. H. G. Winsor. Describes methods employed in securing and maintaining safe and reliable installations. 1500 w. Elec Rev & W Elect'n—March 22, 1913. No. 40774.

Canning Factories

Electricity in Canning Factories. Explains the advantages and gives data. Ills. 1800 w. Elec Rev & W Elect'n—Oct. 11, 1913. No. 45793.

Cement Mills

Electricity in Cement Works. Discusses the power requirements of cement machines, selection of motors, etc. Ills. 3000 w. Elec Rev & W Elect'n—Aug. 23, 1913. No. 44557.

Collieries

See Electric Power, under MINING AND METALLURGY, *Coal and Coke*.

Construction Work

Motor-Driven Winches and Pulley Hoists. H. Thieme. Illustrated description of these mechanisms and the service they render. 1200 w. Elec Wld—Dec. 14, 1912. No. 38214.

Cotton Industry

Electricity in Cotton Mills. Explains how the use of motors has increased production, and gives operating data on several mills. Ills. 3500 w. Elec Rev & W Elect'n—Feb. 1, 1913. No. 39642.

Electricity in Cotton-Seed-Oil Mills. Illustrated description of applications and statement of advantages and data. 3800 w. Elec Rev & W Elect'n—Feb. 15, 1913. No. 39879.

D. C. Plant

Plant of Packard Motor Car Co. A. R. Majer. Illustrated outline of the rapid growth of a direct-current plant. 2500 w. Power—Feb. 4, 1913. No. 39661.

Department Stores

Electricity in Department Stores. Discusses the power requirements of elevators, refrigerating machines, ventilating fans, and miscellaneous machines used, and gives data on illumination, and the best methods of comparing isolated-plant with central station power costs. 3000 w. Elec Rev & W Elect'n—Aug. 2, 1913. No. 44138.

Domestic

The Small Motor in the Home. James C. Munn. Aims to show how one stock motor can be made to do a number of household tasks. Illustrates and describes outfits. 3500 w. Elec Jour—March, 1913. No. 40872.

Electricity in the Household (Die Elektrizität im Haushalte). E. Wikander. The value and uses of electricity for domestic purposes of various natures. 3600 w. Elek u Masch (Special)—March, 1913. No. 41494 D.

Domestic Electric Cooking and Heating—Results of One Year's Working. J. T. Morris. Read before the British Assn. Gives results of one year's actual employment of electricity for cooking and heating in a flat for a family of five persons. 2200 w. Elec'n, Lond—Sept. 19, 1913. No. 45559 A.

Electrical Progress

The Infant Days of Electrical Engineering (Aus den Kindertagen der Elektrotechnik). F. Ross. A 40-year backward glance to the early days of electrical development. Ills. 3600 w. Elek u Masch (Special)—March, 1913. No. 41481 D.

The Development of Electrical Machinery (Die Entwicklung des Elektrizitätswerkes). Edmund von Rziha. A review of generating machinery during the past 30 years. 4800 w. Elek u Masch (Special)—March, 1913. No. 41482 D.

The Development of Heat Motors in the Past 30 Years (Die Entwicklung der Wärmekraftmaschinen in den letzten 30 Jahren). Leopold Kliment. Reviews progress in the improvements of steam and internal combustion engines in relation to their service to electrical progress. 4400 w. Elek u Masch (Special)—March, 1913. No. 41483 D.

Developments in Electrical Machine Construction in the Last 30 Years (Die Entwicklung des Elektromaschinenbaues in den letzten 30 Jahren). Karl Pichelmayer. Refinements in motors, generators, etc., and their sponsors. 4400 w. Elek u Masch (Special)—March, 1913. No. 41485 D.

Developments in Electrical Measuring Devices (Die Entwicklung der elektrotechnischen Messkunde). E. Orlich.

Electric Vehicles

Units of resistance, intensity and capacity, galvanometers, dynamometers, photometry, etc. 4800 w. *Elek u Masch* (Special)—March, 1913. No. 41489 D.

Developments in the Electric Motor Drive (*Die Entwicklung der elektrischen Motorantriebe*). F. Niethammer. The men prominent in pioneer work of this nature, and the lines of their efforts. 4000 w. *Elek u Masch* (Special)—March, 1913. No. 41492 D.

Electric Vehicles

See same heading under **MECHANICAL ENGINEERING, Automobiles**.

Elevators

The Prevention of Accidents in Electric Lifts. Explains the conditions and the means adopted to secure safety. 1800 w. *Elec Rev, Lond*—April 18, 1913. No. 41752 A.

Factories

Notes on a Factory Installation. E. P. Austin. Deals with the distribution, and considers the electromechanical details that belong to the driving of girder-working machines. 2000 w. *Elec Rev, Lond*—Nov. 8, 1912. No. 37632 A.

Electricity in Shoe Factories. H. O. Stewart. Explains the advantages of central-station service, and gives information concerning applications, etc. Ills. 3000 w. *Elec Rev & W Elect'n*—Dec. 7, 1912. No. 38095.

Electricity in Soap Manufacture. Gives data on selection of proper motors, advantages of motor drive, etc. Ills. 2500 w. *Elec Rev & W Elect'n*—July 12, 1913. No. 43677.

Electricity in Broom Manufacturing. Discusses conditions in a typical plant and gives data on other plants. Ills. 2500 w. *Elec Rev & W Elect'n*—July 5, 1913. No. 43472.

Electricity in Piano Factories. States some of the advantages of electric motor drive and gives data. Ills. 2500 w. *Elec Rev & W Elect'n*—Aug. 9, 1913. No. 44268.

Electrical Installation at a French Iron Works. Dr. Alfred Gradenwitz. Illustrated description of the installation of the Soc. Anon. des Usines de l'Espérance, of Louvroil. 2000 w. *Elec Rev, Lond*—Sept. 12, 1913. No. 45285 A.

Electricity in Automobile Manufacturing. Gives data on operating features and horse-power requirements. Ills. 4000 w. *Elec Rev & W Elect'n*—Sept. 20, 1913. Serial, 1st part. No. 45254.

Electricity in the Manufacture of Trunks and Suit Cases. Discusses the advantages and power requirements of the various machines used. Ills. 2000

POWER APPLICATIONS.**Industrial**

w. *Elec Rev & W Elect'n*—Sept. 13, 1913. No. 45113.

Electricity in a Modern Shoe Factory. Illustrated description of the equipment at the Keith shoe factory, South Boston. 2500 w. *Elec Rev & W Elect'n*—Aug. 30, 1913. No. 44875.

Fans

The Electric Ceiling Fan. H. S. Baldwin. Some of the recent forms are described and illustrated. 1200 w. *Gen Elec Rev*—May, 1913. No. 41812 C.

Foundries

Application of Electric Power in the Foundry. H. F. Stratton. Explains how the use of motor-driven equipment effects economies in casting plants. Ills. 4000 w. *Foundry*—Oct., 1913. Special. No. 45705 C.

Greenhouses

Application of Electric Drive in Greenhouses. Illustrates and describes the extensive use of motors in a large floral establishment near Chicago. 2500 w. *Elec Wld*—Oct. 25, 1913. No. 46202.

Heaters

Materials Used in Electrical Heaters. H. O. Swoboda. Considers electrical conductors, thermal conductors, and electrical and thermal insulators. 1800 w. *Elec Jour*—May, 1913. No. 42434.

Introduction to Discussion on Electric Heating and Cooking. T. Roles. Abstract of a discussion held at Leeds and Sheffield. 3500 w. *Elect'n, Lond*—April 28, 1913. No. 41754 A.

Hotels

Electrical Equipment of a Modern Hotel. Illustrated description of the lighting scheme in the McAlpin Hotel, New York, and the system of control of electric circuits to insure continuous service. 2500 w. *Elec Wld*—May 3, 1913. No. 41881.

Hotel Service

Electricity in Hotel Service. The present article deals with power applications. Ills. 3000 w. *Elec Rev & W Elect'n*—Dec. 14, 1912. Serial. 1st part. No. 38206.

Industrial

Electricity in Shoe Repairing. Discusses conditions in this industry, the horsepower requirements of the machines used, costs, etc. Ills. 2000 w. *Elec Rev & W Elect'n*—April 12, 1913. No. 41203.

The Engineering and Commercial Status of Current Consuming Devices. Discusses the demand, industrial applications of motors, control, etc. Ills. 4500 w. *Elec Engng*—April, 1913. No. 41328.

Electricity in Wire-Fence Manufacture. Discusses the advantages of cen-

Industrial

POWER APPLICATIONS

Packing Houses

tral-station service, the machine and motor characteristics and gives operating data on several typical plants. Ills. 3000 w. Elec Rev & W Elect'n—April 5, 1913. No. 41102.

Electricity in Bottling Works. Illustrated article discussing the possibility of central station power in this industry. 3000 w. Elec Rev & W Elect'n—April 19, 1913. No. 41364.

Electricity in the Ceramic Industry (Elektrizität in der keramischen Industrie). Kurt Porsch. Uses in the manufacture of stone ware, porcelain, tile pipes, terra cotta, and cement. Ills. 4900 w. Elek Kraft u Bahnen—Mar. 4, 1913. No. 41499 D.

Electrical Equipment of Industrial Plants. Harry C. Spillman. Illustrated description of the illumination, motor requirements and telephone call system of the Continental Motor Mfg. Co., Detroit, Mich. 1700 w. Elec Wld—May 24, 1913. No. 42389.

Electricity in Coffee and Spice Mills. Illustrate description of a Chicago plant, with tabulated data of typical plants. 2000 w. Elec Rev & W Elect'n—May 17, 1913. No. 42224.

Electricity in Packing Plants. Information and data relating to plants using electric power. Ills. 2400 w. Elec Rev & W Elect'n—May 24, 1913. No. 42386.

Electricity in Harness Manufacture. Gives data on several typical plants using central station power. Ills. 2000 w. Elec Rev & W Elect'n—Oct. 25, 1913. No. 46236.

Electricity in Glass Plants. Discusses the advantages of motor drive applied to glass manufacturing, with detailed data on typical plants. 2500 w. Elec Rev & W Elect'n—Oct. 18, 1913. No. 45957.

Jewelry

Electricity in Jewelry Manufacturing. Detailed analysis of operating costs in a typical converted plant with data on a number of installations. Ills. 1800 w. Elec Rev & W Elect'n—Aug. 16, 1913. No. 44410.

Logging

Electric Logging in the West. Wirt S. Scott. States the principal advantages obtained by the use of motors, and outlines the methods used. Ills. 3000 w. Elec Jour—Sept., 1913. No. 45101.

Logging by Electricity. E. J. Barry. Illustrates and describes the electric logging engines installed in a timber district in Idaho, and gives the results of tests of these machines. 1500 w. Pro Am Inst of Elec Engrs—Sept., 1913. No. 45516 F.

Lumber Industry.

Lumbering by Electricity in the Northwest. Ira E. Church. Discusses the upkeep of three electric mills. Ills. 3000 w. Elec Jour—March, 1913. No. 40869.

Lumber Mills

Lumbering, Planing-mill Practice and Electricity in the Northwest. Ira E. Church. Illustrates and describes applications of electricity and the advantages. 3500 w. Wood Craft—April, 1913. No. 41084.

Marine

See Electric Power, under MARINE AND NAVAL ENGINEERING.

Medical

Electro-Medicine. — Electro-Pathology (Elektromedizin. — Elektropathologie). Dr. S. Jellinek. The medical uses of electricity, and electrical accidents. 6400 w. Elek u Masch (Special)—March, 1913. No. 41498 D.

Mills

Electrical Equipment of the Pacific Mills New Print Works Department. Theodore A. Bergen. Illustrated description of the generating plant, motor installation and alternating current distributing system. 2500 w. Elec Rev & W. Elect'n—June 21, 1913. Serial, 1st part. No. 43120.

Electricity in Button Manufacture. Detailed conditions in typical plants are discussed. Ills. 2000 w. Elec Rev & W. Elect'n—June 21, 1913. No. 43119.

Electricity in Knitting Mills. Discusses the advantages that apply to knitting mills, giving operating data on a number of plants. Ills. 3000 w. Elec Rev & W Elect'n—June 14, 1913. No. 42844.

See Electric Power, under MINING AND METALLURGY, *Iron and Steel*.

Mining

See Electric Power, under MINING AND METALLURGY, *Coal and Coke, Copper, Iron and Steel, and Lead and Zinc*.

See Electric Hoists, under MINING AND METALLURGY, *Mining*.

New Business

New Applications of Electricity as an Adjunct to New Business. F. C. Caldwell. Read before the Ohio Elec. Lgt. Assn. Considers applications of heating, power, and other uses. 3500 w. Elec Rev & W Elect'n—July 26, 1913. No. 43925.

Packing Houses.

Electricity in the Packing Industry. W. D. Bearce. Illustrates and describes applications made by the different companies. 4000 w. Elec Wld—March 1, 1913. No. 40258.

Panama Canal**Panama Canal**

See same heading, under CIVIL ENGINEERING, *Waterways and Harbors*.

Post Office

New Terminal Post-Office in New York. L. B. Marks and J. E. Woodwell. Illustrated description of the electrical and mechanical equipment, wiring and illumination of the government building over the Pennsylvania R. R. yards. 2000 w. Elec Wld—Jan. 4, 1912. Serial. 1st part. No. 38832.

Potteries

Electricity Supply in the Potteries. Illustrated description of the new power station at Stoke-on-Trent and the plant installed. 2500 w. Elec Rev, Lond—April 11, 1913. No. 41376 A.

Power Requirements

Electrical Requirements of Certain Machines in the Rubber Industry. C. A. Kelsey. Outlines the principal operations carried on in a rubber factory and gives figures on the power requirements. Ills. 2200 w. Pro Am Inst of Elec Engrs—July, 1913. No. 43343 F.

Printing

Power Economics in a Printing Plant. Gives facts and figures from a report investigating the cost of electricity and of the operating conditions in an eastern printing plant. 2200 w. Elec Rev & W Elect'n—May 24, 1913. No. 42387.

Quarries

Electrical Equipment and Operation of Limestone Quarries. John Liston. Outlines the system adopted at Calcite, Mich. Ills. 3500 w. Gen Elec Rev—Feb., 1913. No. 39618 C.

Electric Power for Quarries, Gravel Plants and Contract Work. From the report of the Committee on Electricity in Rural Districts presented at meeting of the Nat. Elec. Lgt. Assn. at Chicago. 2000 w. Eng News—June 19, 1913. No. 42983.

Salt Mining

Electricity in Salt Mines. Discusses the advantages of electric drive and gives data on several installations. 1600 w. Elec Rev & W Elect'n—Oct. 4, 1913. No. 45679.

Shovels

Electrically Operated Shovels. Discusses the advantages of electric over steam shovels, giving comparative cost data. 2000 w. Elec Rev & W Elect'n—July 26, 1913. No. 43924.

Steel Plants

Electrically Operated Armour-Plate Rolling Mill at Witkowitz. J. Gutmann. From *Stahl und Eisen*. Illustrated detailed description. 1500 w. Ir & Coal Trds Rev—Dec. 6, 1912. No. 38253 A.

Electricity at the Shelton Iron Co.'s

POWER APPLICATIONS**Woolworth Building**

Works. Illustrated review of the most recent development in the progress of the electrification of the plant. 3000 w. Elec Rev, Lond—Dec. 6, 1912. No. 38234 A.

Stores

Electrical Equipment of a Department Store. Illustrated description of the lighting and motor service installed in the Filene establishment, Boston. 4000 w. Elec Wld—Sept. 20, 1913. No. 45256.

Subways

Utilizing Electrical Energy in the Construction of Subway at Boston. Illustrates and describes machines and methods used in building an important addition to the underground line. 2500 w. Elec Wld—Jan. 4, 1913. No. 38833.

Sugar Making

Electricity Applied to the Manufacture of Sugar. P. S. Smith. Outlines the processes followed and discusses the suitability of the electric drive for operating the various machines. Ills. 1200 w. Gen Elec Rev—Aug., 1913. No. 44087 C.

Tanneries

Electric Power for Tanneries. J. M. Tomb. Reports successful installations, giving data on the application of motors to this work. Ills. 1800 w. Elec Jour—Nov., 1912. No. 37887.

Textile

Electricity in Knitting Mills. Illustrated description of applications with operating data on a number of installations. 3000 w. Elec Rev & W Elect'n—Nov. 30, 1912. No. 37952.

Towage

See same heading, under CIVIL ENGINEERING, *Waterways and Harbors*.

Welding.

See same heading, under MECHANICAL ENGINEERING, *Machine Works and Foundries*.

Wood Working

Power Analysis of a Veneer Plant. C. W. Drake. Brief illustrated description of the application of electric motor drive to such plants. 1000 w. Elec Jour—June, 1913. No. 43227.

Electrically Driven Wood-Working Machines (Elektrisch angetriebene Holzbearbeitungs-maschinen). O. Pollok. New German machinery for sawing, boring, planing and turning wood. Ills. Serial, 1st part. 1600 w. Zeit für Werkzeug—May 25, 1913. No. 43031 D.

Woolworth Building

The World's Highest Office Building. Charles E. Knox. Illustrates and describes the elevator equipment, safety features, generating plant and wiring of the Woolworth Building, New York City. 3300 w. Elec Wld—July 19, 1913. No. 43840.

Consult Classification of the Index. See page 9.

Accidents

TRANSMISSION

Cables

Accidents

See Electric Power, under MINING AND METALLURGY, *Mining*.

Alternating Current

Earthed v. Unearthed Neutrals on Alternating-Current Systems. J. S. Peck. Abstract of a paper read before the Inst. of Elec. Engrs. Discusses the question from the point of view of generating plant, high-voltage transmission circuits and low-voltage distribution circuits. 3000 w. *Elect'n*, Lond—Nov. 29, 1912. No. 38113 A.

Aluminum

Aluminum in Mining Electrical Engineering. J. D. Paton. Abstract of a paper read before the Assn. of Min. Elec. Engrs. Gives extracts from specifications for aluminum stranded wire, suitable for aerial electric power transmission, and information concerning uses made in applications. 2500 w. *Ir & Coal Trds Rev*—April 4, 1913. No. 41250 A.

Arcing Ground Suppressor.

The Arcing Ground Suppressor, and Its Applications. R. H. Marvin. Deals with this apparatus and its uses, its advantages and limitations. Ills. 2000 w. *Gen Elec Rev*—March, 1913. No. 40250 C.

Arresters

The Charging of Aluminum Lightning Arresters. E. E. F. Creighton. This first of three articles reviews briefly the principal characteristics of the aluminum arrester, and discusses the advantages resulting from the use of charging resistances. 7500 w. *Gen Elec Rev*—April, 1913. Serial. 1st part. No. 40991 C.

Interesting Facts Concerning the Horn Gap. A. W. Burke. Brief descriptions of some of the more important types. Ills. 2000 w. *Elec Jour*—June, 1913. No. 43222.

Artificial Lines

A Convenient Form of Continuous-Current Artificial Line. A. E. Kennelly. Illustrates and describes a simple form constructed of simple series and shunt resistances. 1100 w. *Elec Wld*—June 14, 1913. No. 42843.

Atmospheric Phenomena

Atmospheric Electricity (*Elettricità Atmosferica*). Oreste Murani. A study of the phenomena observed in clear weather, thunder storms, St. Elmo's fire, polar auroras, etc. Ills. Serial. 1st part. 4400 w. *Industria*—April 27, 1913. No. 42502 D.

Atmospheric Phenomena and the Disturbances which They Engender in Electric Systems (*Les Phénomènes atmosphériques et les Perturbations qu'ils engendrent dans les Réseaux électriques*). G. Capart. Damages effected by light-

ning, wind, rain, snow, etc., and rules for protection. Ills. 8000 w. *Soc Belge des Elec*—May, 1913. No. 43551 E.

Atmospheric Phenomena and the Disturbance Created by Them in Electric Distributing Methods (*Die atmosphärischen Erscheinungen und die Störungen welche durch dieselben in den elektrischen Verteilungsnetzen hervorgerufen werden*) G. Capart. A review of the list of damages caused by rain, hail, snow, lightning, etc. Ills. Serial. 1st part. 3200 w. *Elek u Masch*—Sept. 14, 1913. No. 46080 D.

Balancers

Direct-Current Balancer Sets. A. C. Lanier. Describes methods employed to maintain voltage balance in the direct-current multi-wire circuits. 5500 w. *Elec Jour*—Nov., 1912. No. 37891.

Cables

The Protective Covering of Rubber Cables. F. Fernie. Brief discussion of the braiding and various troubles with rubber cables. 1000 w. *Elect'n*, Lond—Nov. 29, 1912. No. 38116 A.

Polyphase Cables for 30000 Volts. W. Pfannkuch. Abstract of a paper read before the *Elektrotechnische Verein*. Describes the testing arrangements and tests made of this cable. 1300 w. *Elect'n*, Lond—Jan. 17, 1913. No. 39480 A.

Comparative Calculations on High Tension Cables (*Vergleichende Rechnungen an Hochspannungskabeln*). C. Breitfeld. Comparing the author's calculations on ten-, twenty- and thirty-thousand volt cables with results obtained by G. Roessler in his book, "*Fernleitung von Wechselströmen*." 4800 w. *Elek u Masch*—Dec. 15, 1912. No. 39052 D.

The Testing of Cables by Direct Current. J. Delon and L. Lichtenstein. Abstract of an article in *Elek. Zeit*. Describes an apparatus devised in the laboratory of the *Soc. Française des Câbles Electriques*, at Lyons, and used in a large number of important net works. 1600 w. *Elect'n*, Lond—March 14, 1913. No. 40809 A.

A 60000-Volt Underground Cable Installation. From a paper by Dr. Leon Lichtenstein. Describes an installation for supplying single-phase power to the Dessau-Bitterfeld railway. 1700 w. *Elec Rev*, Lond—March 7, 1913. No. 40701 A.

Electric Cables for Shafts of Mines. E. Kilburn Scott. Read before the London Branch of the Assn. of Min. Elec. Engrs. Discusses the installation of such cables, the conductors, jointing, insulation, etc. Ills. 6000 w. *Ir & Coal Trds*

Cables

TRANSMISSION

Corona

Rev—March 7, 1913. Serial. 1st part. No. 40635 A.

Cable Jointing and Junction Boxes, etc. Chris. Jones. Read before the Assn. of Min. Elec. Engrs. Illustrates and describes methods of making joints and sealing terminal ends in various kinds of cables. 3500 w. Ir & Coal Trds Rev—April 4, 1913. Serial. 1st part. No. 41248 A.

High-Tension Cables on the Railway Between Dessau and Bitterfeld. Dr. L. Lichtenstein. Abstract from *Elektrotechnische Zeit*. Information concerning the construction, laying, and testing of the 60,000-volt cables. 2500 w. Elect'n, Lond—April 4, 1913. No. 41224 A.

Insulated and Bare Copper and Aluminum Cables for the Transmission of Electrical Energy, with Special Reference to Mining Work. Burkewood Welbourn. Abstract of a paper read before the Inst of Min Engrs. Information concerning their use, cost, service, &c. Ills. 5500 w. Ir & Coal Trds Rev—June 6, 1913. No. 42898 A.

Cable Laying and Records. Shows the necessity of employing some system in laying cables and of recording on suitable maps. 1200 w. Elec Rev, Lond—July 18, 1913. No. 43951 A.

The Laying of Alternate Current Mains in Iron Pipes. L. Bloch. Abstract of a paper read before the Elektrotechnische Verein. A report of investigations made in Berlin with statement of results. 1200 w. Elect'n, Lond—July 4, 1913. No. 43706 A.

On the Temperature Rise and Deterioration of the Covering Material of Wire by the Carrying Current. G. T. Hirobe. Abstract of report No. 12 of the Electro-technical Laboratory, Tokio, Japan. Report of investigations. 1000 w. Elect'n, Lond—Aug. 22, 1913. No. 44904 A.

The Heating of Cables Carrying Current. Saul Dushman. Discusses methods of calculating the rates of heating and cooling insulated cables and the current carrying capacity. 3500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40178 F.

Current Rating of Electric Cables. Ralph W. Atkinson and H. W. Fisher. A discussion of the current carrying capacity of electric power cables. 1000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40205 F.

See also Conduits, under *Transmission*, and Submarine Cables, under *Communication*.

Condensers

Protection of Excess Voltages against Atmospheric Discharges with Special Attention to Condensers (Überspannungs-

ungsschutz gegen atmosphärische Entladungen in besonderer Berücksichtigung der Kondensatoren) P. Lang. The preparation of formulæ for studying the capacity of condensers and methods of mounting them. Ills. 2000 w. Elek u Masch—Aug. 24, 1913. No. 46075 D.

Conductors.

Some Practical Considerations in Computing Conductors for Electric Circuits. Anthony Gorman. Considers important factors in determining the size of wires for distribution of electricity. 2000 w. Elec Rev & W Elect'n—March 8, 1913. No. 40379.

Ice Coating on Overhead Conductors. William R. King. Gives a theory based on a destructive ice storm in Portland, Oregon. Ills. 1500 w. Eng Rec—March 8, 1913. No. 40372.

Conduits.

Discussion on "Notes on Underground Conduits and Cables." Paper by C. T. Moseman as discussed at Boston, Mass., May 15, 1912. 10500 w. Pro Am Inst of Elec Engrs—March, 1913. No. 40445 F.

The Manufacture of Electrical Conduit from a Chemical Engineering Standpoint. Oliver W. Storey. Explains the requirements and how they are met. 1200 w. Wis Engr—Jan., 1913. No. 40848 C.

Underground Electric Cable Systems from 30,000 to 60,000 Volts (Réseaux de cables électriques souterrains à 30,000 et 60,000 volts). Description of several such systems on the Continent and in England. Diagrams. 2000 w. Genie Civil—Feb. 15, 1913. No. 40594 D.

Iron Pipe Used for Electric Conduit. Oliver W. Storey. Describes the various methods of treatment to increase the resistance of the pipe to corrosive action, and their comparative durability. 7000 w. Met & Chem Engng—April, 1913. No. 41044 C.

Conduit Laying, Then and Now. Deals with types of conduit used during the last 15 years, the method of laying, etc. 1500 w. Elec Rev, Lond—July 18, 1913. No. 43952 A.

Converters

Mercury Vapor Converters. Maurice Leblanc, Jr. Deals with the principles of mercury vapor converters and their capacity and efficiency. Describes the operation and uses. Ills. 4500 w. Elect'n, Lond—July 18, 1913. No. 43953 A.

Corona

Corona Phenomena on Transmission Lines. Dr. Weidig and Herr Jaensch. Abstract of a report to the Verband Deutscher Elektrotechniker. A summary of work in this field. 2200 w. Elect'n, Lond—Oct. 10, 1913. No. 45970 A.

Experiments on Corona Losses in

Detectors

Transmission Lines. Dr. Weidig and Herr Jaensch. Abstract of paper read before the Verband Deutscher Elektrotechniker. Illustrated report of experimental work. 3300 w. Elect'n, Lond—Oct. 10, 1913. No. 45969 A.

Detectors

Ground Detectors. R. L. Mossman. Gives diagrams showing the various methods of connecting lamps and voltmeters as ground detectors, also the electrostatic detector as used on high-voltage alternating-current circuits. 800 w. Power—Jan. 7, 1913. No. 38841.

Earthing

Practical Points in Connection with Earthing. Ralph R. Smith. Describes practical details adapted by the writer and gives an account of some tests made. Ills. 1800 w. Ir & Coal Trds Rev—Dec. 6, 1912. No. 38257 A.

Practical Notes on Earthing Factory Apparatus. E. P. Austin. Considers points requiring attention in an earthing system, and its importance. 1200 w. Elec Rev, Lond—March 14, 1913. No. 40806 A.

On the Use of Transformers with Mesh-Connected Secondaries for Earthing Three Phase Systems. G. W. O. Howe. Shows the principle involved and gives formulæ by means of which the currents can be calculated, or a suitable transformer chosen. 1500 w. Elect'n, Lond—May 23, 1913. No. 42741 A.

The Grounding of Transmission Lines. Charles P. Steinmetz. Considers a few typical cases to support arguments as to which system is preferable—a system with a grounded neutral, or an isolated system. 2200 w. Gen. Elec. Rev—June, 1913. No. 42584 C.

Grounding

Notes on Grounding of Electrical Systems. H. P. Liversidge. Slightly condensed paper read at the convention of the Int. Assn. of Munic. Elect'ns. Discusses the methods which have proved most effective. 3000 w. Elec Rev & W Elect'n—Aug. 30, 1913. No. 44876.

Grounds

The Unbalancing Effect of Grounds. R. S. Brown. Gives equations deduced by the application of the law which holds for parallel linear charges, the charges in this case being assumed to be concentrated along the axis of the conductor. 1000 w. Elec Rev & W Elect'n—Aug. 16, 1913. No. 44413.

High Tension

International Scandinavian Transmission System. Detailed description of an interesting project for long distance transmission from Trollhättan to Copen-

TRANSMISSION

hagen. Also editorial. 3500 w. Elec Wld—Feb. 8, 1913. No. 39750.

Heavy Current Practice on Both Sides of the Atlantic (Aus der Starkstromtechnik jenseits und diesseits des Ozeans). F. Niethammer. First instalment reviews opportunities for electrical students, and the manufacture of electrical machines in America. Ills. Serial 1st part. 5200 w. Elek u Masch—Jan 5, 1913. No. 40056 D.

140000-Volt Electric Transmission Line. Illustrated description of this high tension line in eastern Michigan. 3000 w. Engr, Lond—April 4, 1913. Serial. 1st part. No. 41245 A.

High Tension Electrical Distribution of 100,000 Volts or More in the United States (Les distributions d'électricité à tension supérieure à 100,000 volts, aux Etats-Unis). A list of companies, with brief sketches of each, and the lightning arresters, conductors, insulators and fire protectors used. 2700 w. Genie Civil—Sept. 6, 1913. No. 45358 D.

High-Tension Lines

The Measurement of Line Sag and Wire Sections as well as the Determination of Line Tension in High-Tension Aerials with Reference to the Rules of the Prussian Imperial Railways (Drahtdurchhang- und Querschnittsbemessung sowie Bestimmung der Montagezüge für Hochspannungsfreileitungen unter Berücksichtigung der Berechnungsvorschriften der Kgl. Preuss. Staatsbahnen). P. Gesing. Formulæ to be used in following these rules. 2400 w. Elek Kraft u Bahnen—July 14, 1913. No. 44680 D.

High Voltage

The Operation of High-Voltage Power Systems. H. H. Dewey. Discusses economical voltage regulation. 2500 w. Gen Elec Rev—June, 1913. No. 42581 C.

Circuit-Connections in High-Voltage Systems. R. E. Argersinger. Recommends that all generators be paralleled on a common bus, properly sectionalized by disconnecting switches, and, in the larger stations, by the insertion of current-limiting reactances. 2000 w. Gen Elec Rev—June, 1913. No. 42582 C.

Influence of Load Variation on the Voltage Drop in High-Tension Aerials (Einfluss der Belastungsänderung auf den Spannungsabfall bei Hochspannungs-Freileitungen). Karl Meller. A discussion of this action with diagrams. 2000 w. Elek u Masch—May 11, 1913. No. 43039 D.

Insulation

Temperature and Electrical Insulation. C. P. Steinmetz and B. G. Lamme. Discusses the durability of insulation, classes of insulation, temperatures and flow of heat, measurement of temperature, with

Insulation

TRANSMISSION

Leakage

recommendations. 3500 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40174 F.

Junction Boxes or the Like, with Constant Insulation of High Value, for Low-Tension Current Installation. A. Ebeling and R. Deibel. Illustrated explanation of the application of a new principle by which good insulation values may be guaranteed 2200 w. Electr'n, Lond—Jan. 24, 1913. No. 39775 A.

The Application of a Theorem of Electrostatics to Insulation Problems. C. Fortescue. Aims to emphasize a principle of electrostatic theory by which the individual units of a system of conductors may be arranged to protect one another. Ills. 4000 w. Pro Am Inst of Elec Engrs—March, 1913. No. 40444 F.

Air as an Insulator When in the Presence of Insulating Bodies of Higher Specific Inductive Capacity. C. L. Fortescue and S. W. Farnsworth. Shows the conditions which determine the disruptive strength of an air path along the surface of a solid dielectric of higher specific inductive capacity, and what steps must be taken to insure the most efficient use of the two dielectrics in combination. Ills. 2800 w. Pro Am Inst of Elec Engrs—March, 1913. No. 40443 F.

Notes on the Testing of Ebonite for Electrical Purposes. C. C. Paterson, E. H. Rayner, and A. Kinnes. Abstract of a paper presented to the Inst. of Elec. Engrs. Discusses methods and results of tests made on known qualities of rubber, with and without adulterants. A specification is suggested for tests on sheet ebonite. 2500 w. Electr'n, Lond—March 7, 1913. No. 40703 A.

Qualifications and Tests of Insulating Materials (Qualification et essais des matières isolantes). E.-J. Brunswick. Detailed specifications covering mechanical properties, heat action, and chemical properties, and the researches by the Physikalisches-Technisch Reichsanstalt. Ills. 9600 w. Tech Mod—Mar. 1, 1913. No. 40692 D.

Suspended Insulators and Protective Insulation in High Tension Systems (Die Hängeisolatoren und die Sicherheit der Isolation von Hochspannungsleitungen). Egon E. Seefehlner. Characteristic types of suspension insulators. Ills. 4400 w. Elek u Masch—Feb. 23, 1913. No. 40572 D.

See also Voltage, under Measurement.

Insulators

Comparative Tests on High-Tension Suspension Insulators. P. W. Sothman. Gives an account of work in connection with the selection of a suitable, high-tension insulator for a transmission line op-

erated at 110,000 volts. Ills. 8500 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38510 F.

High Frequency Tests of Line Insulators. L. E. Imlay and Percy H. Thomas Presents suggestive high frequency insulator tests recently made by the authors, undertaken to determine the availability of a certain insulator for use on a projected 38000-volt line. 6500 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38511 F.

Discussion on "High-Frequency Tests of Line Insulators (Imlay and Thomas), and "Comparative Tests on High-Tension Suspension Insulators" (Lothman), New York, Dec. 13, 1912. Ills. 21000 w. Pro Am Inst of Elec Engrs—April, 1913. No. 41673 F.

High Tension Insulator Tests. A Study of Design Factors. F. F. Brand. Comments on the proper manner of conducting such tests, with a discussion of the potential gradient on two of the common forms of insulators, the pin and suspension types. 4000 w. Gen Elec Rev—April, 1913. No. 40985 C.

Suspension Insulators Suitable for 110000-volt Transmission. Joseph B. Baker. Illustrated description of tests, showing the weaknesses of standard types. 2000 w. Sci Am—April 5, 1913. No. 41041.

The Uses of Artificial Insulating Materials in the Construction of Electrical Apparatus. H. Passavant. Abstract of a paper before the Elektrotechnische Verein. States the most essential properties of insulating material, and discusses points arising in an investigation made. 1700 w. Electr'n, Lond—May 9, 1913. No. 42276 A.

Discussion on "Air as an Insulator When in the Presence of Insulating Bodies of Higher Specific Inductive Capacity" (Fortescue and Farnsworth), and "The Application of a Theorem of Electrostatics" (Fortescue), New York, March 14, 1913. 9500 w. Pro Am Inst of Elec Engrs. May, 1913. No. 42455 F.

Baking of Insulating Varnishes. H. W. Turner and H. D. Symons. Read before the Assn. of Min. Elec. Engrs. Considers insulation of mining electrical machinery. Ills. 2500 w. Ir. & Coal Trds Rev—May 2, 1913. No. 42255 A.

Insulators for High Tension Lines above 5000 Volts (Isolatoren für hohe Spannungen von über 5000 V.) A. Martin-Saxton. Determinations of the form and size of insulators and the methods of testing. Ills. 3200 w. Elek u Masch—Aug. 24, 1913. No. 46074 D.

Leakage

Some Methods of Detecting Leakages

Consult Classification of the Index. See page 9.

Lightning

on Alternating and Continuous-Current-Systems. R. D. Gifford. Illustrates and describes some detectors and recording instruments for use on electrical power circuits. 1200 w. Elec Rev, Lond—June 20, 1913. No. 43369 A.

Electrolytic Detector without Auxiliary Electromotive Force (Détecteur électrolytique sans force électromotrice auxiliaire). P. Jégou. Describes a new device using an amalgam of mercury and zinc as one anode. Ills. 1400 w. Bull Soc Int d Electriciens—June, 1913. No. 43570 F.

Lightning

Lightning-Prints. Charles Fitzhugh Talman. Illustrates and describes forms. 1700 w. Sci Am—June 28, 1913. No. 48197.

Lightning Arresters.

Some Incorrect Methods of Testing Multigap Lightning Arresters. E. E. F. Creighton. Relates tests that have been inappropriately applied to multigap arresters, and explains wherein they are wrong. 2000 w. Gen Elec Rev—March, 1913. No. 40249 C.

European vs. American Practice in Lightning Arresters. E. E. F. Creighton. Compares several forms of arresters used in Europe and not in America. Ills. 4500 w. Gen Elec Rev—Aug., 1913. No. 44092 C.

Electrolytic Lightning Arresters. G. C. Dill. Explains the vital properties of the electrolytic arrester, describing its construction, and giving suggestions in regard to their installation, care, etc. Ills. 4500 w. Elec Jour—Aug., 1913. No. 44594.

Aluminum-Cell Lightning Arresters. John A. Randolph. Illustrates and describes this type, used extensively on high-voltage systems, explaining its action. 2000 w. Power—Sept. 9, 1913. No. 45014.

Lightning Protection

Lightning Protection of Buildings. Ernst J. Berg. Address at convention of Illinois State Elec. Assn. Information based on experience of investigators. 3000 w. Elec Rev & W Elect'n—Nov. 16, 1912. No. 37595.

Line Capacity

Calculating the Motive Capacity and Current Losses in High Tension Three-Phase Aerials. (Ueber die Berechnung der Betriebskapazität und des Stromabfalles bei Hochspannungs-Drehstrom-freileitungen). G. P. Markovitch. A series of formulæ and their explanation. Diagrams. Serial, 1st part. 5200 w. Elek u Masch—June 22, 1913. No. 43542 D.

TRANSMISSION**Line Records**

Formulas for Capacity of Single-Phase Transmission Lines and Cables. C. A. Pierce and F. J. Adams. Deduces formulæ, giving particular attention to the underlying assumptions and to the accuracy which may be expected. 4000 w. Elec Wld—Aug. 16, 1913. No. 44417.

Line Design

Laying-Out Angles in Transmission Lines. Describes three simple methods for the determination of line angles, requiring only bare poles and a 50-ft. measuring tape. 1000 w. Elec Rev, Lond—Nov. 15, 1912. No. 37807 A.

Transmission Line Design. Julian C. Smith. Discusses present practice in the design of large systems. Ills. 2500 w. Sib Jour of Engng—Nov., 1912. No. 37536 C.

Sight Calculations of Aerial Lines (Calcul a vue des lignes aériennes). L. Potin. Graphical methods of overhead line design by the use of the Blondel nomogram system. Diagram. 4800 w. Tech Mod—Oct. 15, 1912. No. 37508 D.

Pressure Drop in Alternating-Current Lines. M. J. Eichhorn. Explains a method for conveniently and rapidly calculating the pressure drop in a. c. transmission lines. 1500 w. Elec Rev & W Elect'n—Jan. 11, 1913. No. 38979.

Some Problems in Traction Development—Tramway Feeding Networks. J. G. Cunliffe and R. G. Cunliffe. A suggestive treatment of the modifications becoming necessary in the design of the feeding networks and in the legislative limitations imposed. Considers the use of boosters. 2500 w. Elect'n Lond—Dec. 27, 1912. No. 38912 A.

Network Problems (Zur Netzspaltung). Josef Herzog. Discussion on the problems of current and tension distribution. Diagrams. Serial, 1st part. 4000 w. Elek u Masch—Feb. 16, 1913. No. 40571 D.

Line Losses

Discussion on "Corona Losses Between Wires at High Voltages" (Harding). "The Law of Corona and Dielectric Strength of Air" (Peck), and "The Electric Strength of Air" (Whitehead). Boston Mass., June 25, 1912. 4000 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37903 F.

The Calculation of Transmission Line Losses. N. E. Funk. Explains a simple, rapid, accurate method of calculation, and may be done on a slide rule. 4500 w. Elec Engng—June, 1913. No. 42725.

Line Records

Distribution Line Records. H. A. Holmes. Outlines a system which will enable information to be obtained immediately. Maps. 1000 w. Elec Wld—

Lines

Aug. 9, 1913. Serial, 1st part. No. 44274.

Lines.

Important Calculations for Wood Pole Transmission Lines. W. T. Ryan. Discusses calculations involved in the consideration of the transmission line as a mechanical structure. 4000 w. So Elec'n—March, 1913. No. 40651.

Surges, Standing and Traveling Waves on Overhead Transmission Lines. Alfred Still. Discusses the relations existing between the inductance and capacity of the circuit. 2200 w. Elec Wld—April 12, 1913. No. 41192.

Accessories in Long-Distance Electric Transmission (Roles de la canalisation dans les transports électriques à longue distance). M. J. Grosselin. A comparative study of overhead and underground lines; poles, insulators, conduits, etc. Ills. 7200 w. Mem Soc Ing Civ de France—Jan., 1913. No. 42168 G.

A Graphical Method for the Calculation of Short Transmission Lines. Fredrik Waern. Gives a chart and explanation of its use. 800 w. Gen Elec Rev—June, 1913. No. 42595 C.

Practical Calculations of Long Distance Transmission Line Characteristics. F. W. Peck, Jr. Considers regulation, efficiency, phase control of voltage, etc., discussing methods. 2500 w. Gen Elec Rev—June, 1913. No. 42593 C.

Some Mechanical Characteristics of the Modern Transmission Line. T. A. Worcester. Discusses types of support, loads, factors of safety, arrangement of conductors, insulators, and right of way. Ills. 3000 w. Gen Elec Rev—June, 1913. No. 42591 C.

Theory of the Non-Elastic and Elastic Catenary as Applied to Transmission Lines. C. A. Pierce, F. J. Adams, and G. I. Gilchrist. Deals with the theory of the catenary as applied to transmission lines, and experimental data are compared with the values derived by use of the theoretical equations. 3500 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43212 F.

The Transmission of 60,000 Volts from Grenoble to Saint Chamond (Le transport d'énergie à 60,000 volts de Grenoble à Saint-Chamond). V. Sylvestre. General description of power house and equipment, with details of transmission towers and insulators. Ills. 9000 w. Tech Mod—July 1, 1913. No. 43581 D.

High Tension Lines of More than 100,000 Volts in the United States (Hochspannungsanlagen von mehr als 100,000 volt in dem Vereinigten Staaten von Amerika). E. Schwartzkopf. Descrip-

TRANSMISSION

tion of nine of the largest transmission lines; the first part describing the Central Colorado Power Company's line. Ills. Serial, 1st part. 3000 w. Glaser's Ann—June 15, 1913. No. 43519 D.

Graphical Statics Applied to Transmission-Line Calculations. Alfred Still. The problem of overhead lines on steep grades is considered. 2500 w. Elec Wld—Aug. 2, 1913. No. 44147.

Mechanical Characteristics of Long Spans. A. R. Zahorsky. Reviews formulae for the calculation of sags and stresses of a conductor. 1000 w. Elec Rev & W Elec'n—Aug. 9, 1913. No. 44269.

Supplying the Isolated Consumer from the Transmission Line of Moderate Voltage. E. B. Merriam. Illustrates and describes a number of installations in successful operation. 3500 w. Gen Elec Rev—Aug., 1913. No. 44086 C.

Design of an 1180 ft. Transmission-Line Span. K. Nogami. Illustrated account of an installation in Japan, with calculations for the span across the strait of Indo Kaikyo. 1500 w. Elec Wld—Aug. 9, 1913. No. 44271.

60000-Volt Steel-Tower Line Construction in Southern California. Harry W. Dennis. Explains the reasons for the tower-line construction and describes the work. Ills. 5000 w. Elec Wld—Aug. 9, 1913. No. 44273.

Effects of Ice Loading on Transmission Lines. V. H. Greisser. A record of experience and tests, describing the manner of making the tests, and showing the results graphically. Ills. 2500 w. Pro Am Inst of Elec Engrs—Sept., 1913. No. 45515 F.

Catenary Line Construction on Curves. W. Schaanke. Drawings and descriptions of various forms of construction. 1000 w. Elec Jour—Oct., 1913. No. 46336.

Long Distance Transmission System of The Berlin Electric Plant. (Das Ueberlandnetz der Berliner Elektrizitäts-Werke) E. Rühle. General description of the plant and network system. Ills. 1700 w. Elek Kraft u Bahnen—Sept. 4, 1913. No. 46090 D.

Line Sag

Sag in Long Spans for Transmission Lines. W. T. Ryan. Gives a direct method of calculating the sag in wires in which allowance is made for all variations. 2500 w. Elec Rev & W Elec'n—Jan. 18, 1913. No. 39227.

Line Spans

Diagram for Wire Spans. O. von Voigtlander. Gives a diagram to facilitate calculations, explaining its use.

Consult Classification of the Index. See page 9.

Line Stresses

1200 w. Eng News—Dec. 19, 1912. No. 38336.

Line Stresses

Stresses Produced in a Transmission Line by Breaking of a Conductor. R. S. Brown. Analysis made to determine stresses. 1200 w. Elec Wld—March 29, 1913. No. 40951.

Load Disturbances

Disturbances of Potential and Current Produced in an Active Conducting Network by the Application of a Leak Load. A. E. Kennelly. A study of the effect of applying a known leak load to any given network of direct-current or alternating-current circuits. 2500 w. Elec Wld—Dec. 28, 1912. No. 38694.

Loads

Maximum Loads of Transmission Lines. H. B. Dwight. Outlines the factors limiting the loading of a transmission line and indicates their relative importance, showing what calculations should be made in determining the proper line for a given case. 2500 w. Elec Jour—Sept., 1913. No. 45100.

Long Distance

The Thury Continuous-Current Series System, with Special Reference to Long-distance Transmission. Alfred Still. Has special reference to straight long-distance transmission at constant current. Also editorial. 3000 w. Elec Wld—Nov. 30, 1912. No. 37949.

Networks

Some of the Properties of Electric Networks (Ueber einige Eigenschaften der elektrischen Leitungsnetz). H. Frohman. Formulae and diagrams explaining some of the characteristics. 3200 w. Elek u Masch—Sept. 29, 1912. No. 37470 D.

Methods in Calculating Electric Networks (Verfahren zur Berechnung elektrischer Leitungsnetze). H. Frohmann. Mathematical discussion with diagrams. 2800 w. Elek u Masch—Sept. 28, 1913. No. 46082 D.

Outdoor Stations

Some Features of the Outdoor Electrical Installation. F. C. Green. Illustrates and describes types of outdoor stations and discusses their advantages and disadvantages. 4500 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37896 F.

Poles

Results of Life Tests on Treated and Untreated Chestnut Poles. Explains method of treating the poles and gives results of experimental tests. 800 w. Elec Wld—Nov. 30, 1912. No. 37951.

A Rapid Method for Calculating Metal Poles (Une Méthode rapide pour le calcul des poteaux métalliques). Osc. Colard. Empirical formulae for the bracings of

TRANSMISSION

Rates

metal towers. Diagrams. 2400 w. Soc. Belgs d'Elec—March, 1913. No. 42171 E.

Notes on the Calculation of Masts for Use with Suspended Insulators (Beitrag zur Mastenberechnung bei Verwendung von Hängeisolatoren). Hans Grünholz. Mathematical discussion. Ills. 2500 w. Elek u Masch—July 6, 1913. No. 44688 D.

Report of the Committee on Joint Use of Poles. Abstract of paper read before the Am Elec Ry Assn. Ills. 2000 w. Elec Ry Jour—Oct. 17, 1913. (Daily Ed.) No. 45956.

The Economical Aspects of Creosoting Processes for Wooden Transmission Poles. (Zur Frage der Wirtschaftlichkeit der Kresotierungsverfahren für hölzerne Leitungsmaste) Robert Nowotny. The cost and life of treated poles as against the cost and life of untreated ones, with a study of the most economical treatment for best financial results. 2000 w. Elek u Masch—Sept. 7, 1913. No. 46078 D.

See also Lines, under *Transmission*; Reinforced Concrete and Forest Products, under *CIVIL ENGINEERING, Materials of Construction*.

Power Distribution

Progress in Electric Power Distribution Practice. Louis Bell. Reviews the features entering into power distribution problems with special reference to those of conversion to direct current. 2000 w. Elec Ry Jour—Jan. 4, 1913. No. 38827.

Protective Devices

Theory and Practice in Excess Voltage Protection (Theorie und Praxis des Ueber Spannungsgeschützes). E. Pfiffner. This first article discusses the mathematical theory involved. Ills. Serial. 1st part. 4000 w. Elektrotech u Maschinenbau—Nov. 17, 1912. No. 38465 D.

Practical Research for Means of Protection against Excess Voltage of Atmospheric Origin (Recherches pratiques sur les moyens de protection contre les surtensions d'origine atmosphérique). A. Waeber and G. Capart. Gives results of close studies for ten years on high aerial installations. Ills. and Plate. 4800 w. Tech Mod—Dec. 1, 1912. No. 38487 D.

A Classification of Protective Apparatus Used in High-Voltage Lines. V. E. Goodwin. A résumé of all apparatus whose aim is protection against abnormal conditions of service. 1500 w. Gen Elec Rev—June, 1913. No. 42592 C.

Rates

Net Costs, Selling Price and Rate Making of Electric Power (Prix de revient, prix de vente et modes de tarification de

Consult Classification of the Index. See page 9.

Relays

l'énergie électrique). A. and M. Villaret. An examination of these three factors influencing the installation of electrical plants. Diagrams. 7200 w. Tech Mod—Dec. 15, 1912. No. 39070 D.

Relays

A Highly Sensitive Relay. H. Rohmann. Trans. from *Phys. Zeit.* Describes a new arrangement which utilizes the deflection of sensitive measuring instruments, without reducing their sensitiveness. 1200 w. Elect'n, Lond—Sept. 12, 1913. No. 45289 A.

Safety Appliances

Safeguarding the Use of Electricity in Mines. H. H. Clark. Discusses the underground conditions that are unfavorable to the proper installation and maintenance of electrical equipment and suggests methods of making safer the use of electrical equipment in mines. 3000 w. Pro Am Inst of Elec Engrs—April, 1913. No. 41670 F.

See also Accidents, under *Miscellany*.

Safety Devices.

The Dangers from the Use of Electrical Domestic Apparatus and Proposals for an Effective Elimination of These Dangers (Die Gefahren beim Gebrauch der elektrischen Haushaltsapparate und Vorschläge für die gründliche Beseitigung dieser Gefahren). W. Vogel. Advocating well insulated cords and wiring for all domestic appliances. Ills. 3300 w. Elek Kraft u Bahnen—Feb. 14, 1913. No. 40566 D.

Series System

The Transmission of Electrical Energy by Continuous Current on the Series System. J. S. Highfield. Compares the series transmission system with the more usual three phase, dealing with questions of cost, earthing and design as affecting power. 7500 w. Inst of Elec Engrs—May 21, 1913. No. 42876 N.

Stray Currents

Stray Electric Currents. C. J. Norwood. Information concerning three instances where shots in mines were prematurely exploded by electric currents. 1800 w. Mines & Min—Feb., 1913. No. 39623 C.

The Question of Stray Currents and the German Earth-Current Rules (Die Frage der vagabundierenden Ströme und die deutschen Erdstromvorschriften). Johannes Rautenkrantz. Description of instruments used in measuring earth voltage, resistance and intensity. Ills. 5600 w. Elek u Masch—Aug. 10, 1913. No. 44694 D.

Submarine Cables

Submarine Transmission Line in the Baltic Sea. Illustrates and describes methods used in laying submarine cables.

TRANSMISSION

800 w. Elec Wld—Aug. 9, 1913. No. 44272.

Submarine Power

Submarine Power Transmission in the Baltic. Brief illustrated description of an interesting scheme of power transmission by high-tension submarine cables. 2000 w. Elec Rev, Lond—July 11, 1913. No. 43892 A.

Substations

The Portable Rotary Converter Substation. B. W. Kerr. Gives practical applications showing the worth of such stations, and drawing and brief description of a type of construction giving low cost and satisfactory operation. 1400 w. Elec Jour—Feb., 1913. No. 40153.

New Substations in Buffalo. Illustrated description of the buildings, design and the arrangement of equipment. 2000 w. Elec Ry Jour—May 10, 1913. No. 41971.

Automatic Substations. H. R. Summerhayes. Describes the automatic substation at Detroit, in which there is working a synchronous converter controlled entirely from a distant station; also observations on automatic substations in general. Ills. 5000 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43204 F.

Elaborate Sub-Station in St. Louis. Illustrated description of the building and its equipment. 1500 w. Elec Trac—June, 1913. No. 42849.

Substation of Stockholm Municipal System. E. Andreason. Describes the design and operating features of a substation with 9000 kw motor-generator equipment and 30000-amp-hr. storage battery. 2000 w. Elec Wld—June 14, 1913. No. 42841.

Industrial Substations. H. P. Liver-side. Traces the development of such substations, discussing the factors governing the design and installation of this class. Ills. 5000 w. Pro Am Inst of Elec Engrs—Oct., 1913. No. 46341 F.

Terminals

I. The Condenser Type Outlet Terminal. C. Fortescue. Discusses the theory of design. II. Construction and Application. J. E. Mateer. Illustrated description. 5000 w. Elec Jour—Aug., 1913. No. 44592.

Three Phase

Inductance and Capacity of Three-Phase Transmission Lines. Louis Cohen. Mathematical. 1000 w. Elect'n, Lond—July 18, 1913. No. 43954 A.

Thury System

The Thury System of Power Transmission by Continuous Currents. Alfred Still. Describes this direct-current system, its advantages and disadvantages.

Thury System

Consult Classification of the Index. See page 9.

Tower Design

2500 w. Elec Wld—Nov. 23, 1912. No. 37771.

Tower Design.

Transmission Tower Design for the Central Colorado Power Company. W. E. Belcher. Describes single circuit transmission towers for carrying electrical conductors. Ills. 3000 w. Elec Wld—March 22, 1913. No. 40780.

Towers

Structural Steel Poles and Towers. From a paper by R. Fleming before the Assn. of Ir. & St. Structural Engrs., giving data on the design and construction of supports for electric transmission lines. 2200 w. Eng Rec—Dec. 28, 1912. No. 38579.

Structural Steel Towers and Poles. R. Fleming. From a paper before the Assn. of Ir. & St. Elec. Engrs. A discussion of steel supports for telegraph and telephone lines. Ills. 6500 w. Eng News—Nov. 28, 1912. No. 37937.

Stability Tests on Iron-Frame Masts (Festigkeitsversuche an eisernen Fachwerkmasten). L. Schaller. Describes tests made by the Alb. Buss & Co., Baden, on their transmission towers. Ills. 4400 w. Zeitschr des Ver deutscher Ing—Nov. 23, 1912. No. 38451 D.

Transformer Losses

Stray Losses in Transformers. C. Fortescue and W. M. McConahey. Aims to obtain a convenient method of evaluating the actual losses in the copper of a transformer and in figuring the regulation. 2000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40189 F.

Losses in Transformers. W. W. Lewis. Divides transformer losses into no-load and load losses, the former including core and dielectric losses, and the latter resistance and stray losses. Gives results and tests. 5000 w. Pro Am Inst of Elec Engrs—Feb., 1913. No. 40200 F.

Transformers

Abnormal Strains in Transformers. Charles P. Steinmetz. An analysis of over-voltage, over-current, and over-frequency strains. An intricate subject explained in the simplest possible manner. 3500 w. Gen Elec Rev—Dec., 1912. No. 37993 C.

Some Notes on the Installation and Operation of High-Voltage Transformers. H. H. Hodgman. Suggestions for assembling and installing high tension transformers to ensure satisfactory operation. 5500 w. Gen Elec Rev—Dec., 1912. No. 37995 C.

Care and Operation of Transformers. W. M. McConahey. Considers methods of removing moisture and effects of over loads in oil, water and air-cooled types.

TRANSMISSION

3500 w. So Elect'n—Nov., 1912. No. 37659.

Care and Operation of Transformers. W. M. McConahey. Deals mainly with oil-insulated transformers. 5500 w. Elec Jour—Nov., 1912. No. 37886.

Magnetic Leakage in Transformers. J. Murray Weed. Discusses the reactance, eddy-current loss, and mechanical stresses resulting from this cause. 2500 w. Gen Elec Rev—Dec., 1912. No. 37996 C.

Commercial Tests of Lighting Transformers. V. M. Montsinger. Describes manner of testing, illustrating with line drawings. 1000 w. Elec Rev & W Elect'n—Nov. 30, 1912. No. 37953.

Design of Piping for Transformer Oil, Air and Cooling Water. Fred Buch. Considers in detail the oil system, the storage tank, oil treating outfit, the method of transformer pipes, connections, oil filter, etc. Diagrams. 2500 w. Elec Wld—Dec. 7, 1912. No. 38098.

Rib-Cooled Transformers (Kühlrippen-transformatoren). M. Vidmar. Describes new type of oil-cooled transformer. Ills. Serial. 1st part. 3500 w. Elektrotech u Maschinenbau—Nov. 10, 1912. No. 38464 D.

Simple Transformer Formulae. J. K. Caterson-Smith. Gives dimensional formula for alternating-current transformers, with examples of application. 1000 w. Elect'n, Lond—Jan. 3, 1913. No. 39140 A.

Series Types of Dry Transformers (Typenreihen von Trockentransformatoren). M. Vidmar. Mathematical considerations entering into their design. Diagrams. 5200 w. Elek u Masch—Dec. 15, 1912. No. 39053 D.

Methods of Obtaining Greater Flexibility of Operation in Standard Transformers. George A. Thornton and George Goldman. Remarks on the improvements in quality of materials and suggestions for increasing the economies of transformer manufacture. 1500 w. Elec Wld—Feb. 22, 1913. No. 39995.

Three-Phase to Single-Phase Transformation. W. W. Lewis. Analyzes and compares some of the schemes of connections, especially applicable to the electric welding industry. 100 w. Gen Elec Rev—Feb., 1913. No. 39613 C.

Low Tension Distribution and Methods of Hanging Transformers. Recommendations of the Committee of Line Construction. A comparison of individual transformers and low-tension network distribution. Ills. 3500 w. So Elect'n—Feb., 1913. No. 39876.

Testing High Tension Transformers. H. G. Davis. The present article con-

Transformers

siders resistance measurements, polarity indications, ratio determination, top voltage measurement, and parallel run. 1800 w. So Elect'n—March, 1913. Serial. 1st part. No. 40649.

Characteristics and Limitations of the Series Transformer. A. R. Anderson and H. R. Woodrow. A study of the imperfections of the series transformer, to determine how and to what extent certain constants influence its operation. 45 pp. Univ of Ill, Bul 61—Oct. 28, 1912. No. 41718 N.

The Transformation Ratio of Common Transformers with Any Distributed Windings (Das Uebersetzungsverhältnis des allgemeinen Transformators mit beliebig verteilten Wicklungen). F. Niethammer and E. Siegel. A study of the trapeze-triangle-transformer. Diagrams. 5600 w. Elek u Masch—Mar. 30, 1913. No. 41480 D.

Decreasing Frequency of Transformers. F. A. Annett. An article in response to inquiries relative to the effect on the transformer losses of changing from 60 to 50 cycles. 800 w. Power—May 6, 1913. No. 41890.

On Three-Phase vs. Three Single-Phase Transformers. William Nesbit. Discusses the advantages and disadvantages applying to both types. 4000 w. Elec Jour—May, 1913. No. 42433.

Operating Characteristics of Transformers. Frank T. Wyman. Considers the characteristics of a transformer, which enters into its operation. Ills. 3500 w. Jour of Ohio Soc of Mech, Elec, & Steam Engrs—May, 1913. No. 42445 N.

High-Voltage Transformer Leads: A Comparison of Designs. Eugene D. Eby. Enumerates the requirements and treats of the theory upon which the design of all such leads is based. Ills. 4000 w. Gen Elec Rev—June, 1913. No. 42589 C.

Modern Power Transformers. W. S. Moody. Considers the factors which a builder of a large transformer must be able to calculate, and recent developments. Ills. 1200 w. Gen Elec Rev—June, 1913. No. 42590 C.

The Formation of Deposits in Oil-Cooled Transformers. A. C. Michie. Deals with the "sludging" of transformer oil, describing tests and theories. Concludes that it is an oxidation process. 2000 w. Elect'n, Lond—May 16, 1913. No. 42532 A.

Transformer Capacity and Connections for Induction Motor Feeder Circuits. J. L. Moon. Gives rules and tabulated data for determining approximately the size of transformer needed to take care

TRANSMISSION

of an induction motor load of given voltage and horse-power. 1200 w. Gen Elec Rev—July, 1913. No. 43330 C.

Connecting Transformers and Motors in Industrial Plants. A. L. Temple. Considers the arrangements of transformers for highest efficiency and convenience. 1000 w. Prac Engr—Sept. 1, 1915. Serial, 1st part. No. 44862.

Important Considerations When Ordering Power Transformers. H. G. Davis. Considers primary and secondary voltages and capacity and cost of operation. 2500 w. Elec Engng—Sept., 1913. No. 45021.

Transformer Characteristics. Edward T. Moore. Discusses the rating of transformers in the present article. 2000 w. Power—Sept. 23, 1913. Serial, 1st part. No. 45274.

Merits and Early History of Some Phase-Transforming Systems. William T. Taylor. Editorial letter giving diagrams and descriptions of various systems. 2500 w. Elec Wld—Sept. 27, 1913. No. 45494.

The Operation of Large Transformers Out-of-Doors. F. C. Green. Illustrated discussion of the outdoor use of transformers and their successful operation. 2000 w. Gen Elec Rev—Oct., 1913. No. 45586 C.

The Relative Cost of Three-Phase and Single-Phase Transformers. V. L. Hollister. Discusses the relative cost of the three-phase transformers and the equivalent three single-phase units for the same service and equivalent capacity. 1600 w. Engineering Magazine—Sept., 1913. No. 44770 B.

Three-Phase Transformation. Charles H. Russell. Discusses the uses, advantages and disadvantages of different types of transformers and arrangements. 4000 w. Ap Sci—July, 1913. No. 44332 C.

The Ratio of Transformation in the General Transformer with Distributed Windings. Dr. F. Niethammer and Dr. E. Siegel. Shows that in transformers with the primary and secondary windings differently distributed the pressures and currents are not in simple relation to the number of turns. Formulas are given. 2000 w. Elect'n, Lond—Aug. 15, 1913. No. 44711 A.

Transformers for Outdoor Service. Explains how to overcome the difficulties encountered. Ills. 1500 w. Coal Age—Aug. 2, 1913. No. 44144.

Pole Type Transformers. C. E. Sisson. Calls attention to details in the design and construction of the modern lighting transformer both from the operator's and

Consult Classification of the Index. See page 9.

Voltage Regulation

manufacturer's view. 3500 w. Can Elec Assn—June, 1913. No. 44819 N.

One Hundred and Fifty Thousand Volt Power Transformers, with Especial Reference to the Installation of the Pacific Light & Power Corporation. W. H. Dann. Illustrated description of the construction of these transformers. 1800 w. Elec Jour—Aug., 1913. No. 44596.

See also Transformer Tests, under *Measurement*, and Discussions, under *Miscellany*.

Voltage Regulation

Feeder Voltage Regulation. E. E. Lehr. Illustrates and describes regulators of the induction type and the auxiliary apparatus. 3000 w. Elec Jour—Nov., 1912. No. 37885.

Automatic Voltage Regulation of Alternating-Current Generators. Lester McKenney. Discusses the relation of the automatic regulator to the apparatus to be controlled, and matters affecting its

MISCELLANY**Co-operation**

operation. 2500 w. Elec Wld—Nov. 9, 1912. No. 37372.

Voltage Regulation of Polyphase Feeders by Automatically Controlled Feeder Voltage Regulators. M. Unger. Discusses a number of methods of connecting automatically controlled single and polyphase regulators to polyphase feeders. 3000 w. Gen Elec Rev—Dec., 1912. No. 37999 C.

Wiring.

Methods of Splicing Wires and Cables. H. V. Talbot. Illustrates and describes methods. 1200 w. Elec Wld—March 15, 1913. No. 40672.

Modern Methods of Electric Wiring. Frank Broadbent. Abstract of a paper read before the Engrs-in-charge. Mainly a description of the distribution system both for lighting and electric motors. Explains the looping method of branching conductors, insulation, etc. 4500 w. Mech Engr—Feb. 28, 1913. No. 40479 A.

MISCELLANY**Accidents**

A French Inquiry into Electrical Accidents, and Suggestions for Preventing Them. W. Steuart. Gives results of investigations. 2000 w. Elec Rev, Lond—April 4, 1913. No. 41220 A.

Prevention of Accidents in Central Stations. An illustrated account of the work of the New York Edison Co. in this field. 1500 w. Elec Wld—May 10, 1913. No. 41966.

The Danger of Life Involved in Directing a Stream of Water from a Fire Hose Upon a High-Tension Line. F. C. Caldwell. Report of investigations. 800 w. Sib Jour of Engng—May, 1913. No. 42419 C.

Accidental Electrocutation (Les accidents d'électrocution). J. J. Langlois. Theories on physiological action in electric shocks; studies on the resistance, etc., of the human body, and treatment. 7200 w. Rev gen des Sciences—April 30, 1913. No. 42179 D.

See also Elevators, under *Power Applications*.

Address

Mr. William Duddell's Address to the Institution of Electrical Engineers. (Abstract.) Urges the broadening of the work of the Institute, explaining the neglected fields. 6000 w. Elect'n, Lond—Nov. 22, 1912. No. 38022 A.

Address before the Incorporated Municipal Electrical Association. C. E. C. Shawfield. Reviews the growth of electricity supply in England. 2200 w.

Elect'n, Lond—June 20, 1913. No. 43370 A.

Advertizing

Central Station Advertizing. D. H. McDougall. Considers methods of advertizing. 1500 w. Can Elec Assn—June, 1913. No. 44818 N.

Australasia

An Electrical Engineer's Tour in Australasia. Justus Eck. An interesting account of what has been accomplished in the electrical field. 6500 w. Aust Min Stand—May 22 & 29, 1913. Serial. 2 parts. No. 43168 each B.

Austria

The Electrical Industry During 1912 (Die elektrotechnische Industrie im Jahre 1912). Emil Honigman. A review of the industrial uses of electricity in Austria. Serial. 1st part. 3200 w. Elek u Masch—June 1, 1913. No. 43045 D.

By-Product Plants

Gas-Electric and By-Products Recovery Plant at the Accrington Electricity Works. Illustrated detailed description of this plant. 1800 w. Elec Rev, Lond—Aug. 15, 1913. No. 44708 A.

Congress

Colorado Meeting of the American Electrochemical Society. A report of the meeting held at Denver, Boulder and Golden, Colo., with abstracts of papers. Ills. 2500 w. Met & Chem Engng—Oct., 1913. No. 45782 C.

Co-operation

The New Movement of Co-operation in the Electrical Industry. L. B. Judson.

Consult Classification of the Index. See page 9.

Copper

Outlines the plans now being agitated. 3500 w. Gen Elec Rev—May, 1913. No. 41813 C.

Copper

Copper—Its Uses in Large Electrical Works. J. L. Jones. Outlines the characteristics of copper, methods of production from the ores and from reclaimed copper, its working and applications. 2500 w. Elec Jour—Sept., 1913. No. 45104.

Dangers

Electrical Dangers. S. Lees. Calls especially attention to dangers for workers among live wires, and criticizes practices needing to be corrected. 1700 w. Elec Rev, Lond—Jan. 31, 1913. No. 39773 A.

Common Electrical Dangers. William S. Boyd, in *Safety Engng.* Dangers from improper wiring, fixtures, motor equipments, etc., are discussed. 1500 w. Elec Rev & W Elect'n—Aug. 23, 1913. No. 44560.

Discussions

Discussion on "The Use of Reactance in Transformers," W. S. Moody, and "The Effect of Temperature Upon the Hysteresis Loss in Sheet Steel," Malcolm Maclaren, at New York, Oct. 11, 1912. Ills. 6500 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38512 F.

Economics

Electric Propaganda and Possible Methods for Increasing the Sales of Electric Power and Electrical Appliances (Elektrizitätspropaganda und sonstige Mittel zur Erhöhung des Absatzes von elektrischem Strom und elektrischen apparaten). E. Wikander. Proposals for meeting the increased competition with gas companies. Discussion. 3500 w. Elek u Masch—Feb. 2, 1913. No. 40568 D.

The Financial Needs of the Electrical Industry. Frank A. Vanderlip. A statement of the recent growth and future capital requirements. 5000 w. Elec Wld—Sept. 13, 1913. No. 45117.

Electrical Instruments

Electrical Instruments and Meters in Europe. H. B. Brooks. Describes the works of 31 leading firms as to organization, methods and products. 88 pp. U S Bureau of Foreign & Domestic Com—No. 66. No. 41716 N.

Electrotechnical

The Aims and Work of the International Electrotechnical Commission. Silvanus P. Thompson. Abstract of a paper before the Inst. of Elec. Engrs. An outline of the work already accomplished. Discussion. 4000 w. Elect'n, Lond—Jan. 3, 1913. No. 39139 A.

Exhibition

Electricity at the Ghent Exhibition.

MISCELLANY

Illustrated review of the electrical exhibits and the supply of current. 1500 w. Elec Rev, Lond—Sept. 5, 1913. Serial, 1st part. No. 45142 A.

France

The Electrical Industry in France. Georges Dary. A summary of the new electrical distribution systems in Paris, the projected utilization of the river Rhone, the electrification of the Paris suburban railways, and other developments of interest. 3000 w. Elec Rev, Lond—May 16, 1913. Serial. 1st part. No. 42528 A.

Gramophone

The Development of the Talking Machine. Emile Berliner. Address on receiving the Institute's Elliott Cresson Medal. 4000 w. Jour Fr Inst—Aug., 1913. No. 44542 D.

Handbook

A Solicitor's Pocket Book. Describes a condensed compendium of information constructed by the writer, using plotted curves. 1200 w. Elec Rev & W Elect'n—Aug. 16, 1913. No. 44411.

Hiring Schemes

Apparatus on Hire. T. C. Parsons. Discusses the advantages of hiring electrical apparatus for temporary or permanent work. 2000 w. Elec Rev, Lond—Sept. 12, 1913. Serial, 1st part. No. 45286 A.

Liquid Air

Elementary Theories of Liquid-Air Machines (Théorie élémentaire des machines à air liquide). H. Brot. Mathematical discussion on the Linde and Claude machines. Ills. 18000 w. Rev. de Mecan—July, 1913. No. 45331 E + F.

London

Electricity Supply in London. An account of the present state of electricity supply in London and information concerning its development. Ills. 17000 w. Elect'n, Lond—June, 13, 1913. No. 43131 A.

Monopolies

The Electrical Installation and Electrical Material Monopoly (Das elektrische Installations- und Materialmonopol). Heinrich Schreiber. Advantages and disadvantages of monopolistic control. 5000 w. Elek u Masch—Feb. 9, 1913. No. 40569 D.

Municipal Control

Control of Electrical Installation by the Municipality. H. S. Wynkoop. Read before the Kilowatt Club. Discusses the enforcing suitable regulations for the installation of electrical appliances, the construction of a license law, and related topics. 1500 w. Elec Rev & W Elect'n—Oct. 25, 1913. No. 46237.

New England

New England

Electric Development in New England. Illustrated description of the four-million dollar project on the Deerfield River in Massachusetts and Vermont. 6500 w. Elec Wld—Dec. 28, 1912. No. 38693.

Nomenclature

The Nomenclature and Definitions of Magnetic and Electrical Quantities. Report of a committee of the British Association. 3000 w. Elect'n, Lond—Sept. 26, 1913. Serial. 1st part. No. 45731 A.

Problems

Future Problems of Electrical Engineering. Dr. C. P. Steinmetz. An examination of present tendencies, concluding that they point to the separation of the use of electric power from its generation, the concentration in a unified system, improvement of the load factor, etc. 5000 w. Jour W Soc of Engrs—March, 1913. No. 41269 D.

Reviews of 1912

Electrical Engineering in 1912. Reviews the progress during the past year in the electrical industry—the power plants, electric railways, dynamos and motors, ship propulsion, electric lighting, etc. 6000 w. Engr, Lond—Jan. 3, 1913. No. 39165 A.

A Review of the Year in the Electrical Industry. Brief review of developments in telephony and telegraphy, illuminating engineering, electric railways, electrochemistry, electrical machinery, etc. 10000 w. Elec Rev & W. Elect'n—Jan. 4, 1912. No. 38814.

MISCELLANY

Electrical Progress and Development During 1912. Reviews recent developments in electrical apparatus and its application. 12700 w. So Elect'n—Jan., 1913. No. 39215.

Rules

Standardization Rules for Electrical Machinery. Gives the rules provisionally adopted by the Council of the British Electrical and Allied Mfrs.' Assn. 3000 w. Mech Engr—May 23, 1913. No. 42750 A.

Statistics.

Review of Statistics of Electric Power Plants and Electric Railways in Austria to January 1st, 1913. (Ergebnisse der Statistik der Elektrizitätswerke und der elektrischen Bahnen in Oesterreich nach dem Stande vom 1. Jänner 1913). L. Rosenbaum. Tables. 2000 w. Elek u Masch—Feb. 16, 1913. No. 40570 D.

Steinmetz

Charles Proteus Steinmetz. Douglas Sutherland Martin. Brief review of his important share in electrical progress. 2000 w. Sci Am Sup—July 12, 1913. No. 43497.

Terminology

Report on the Terminology of Machines (Rapport sur la terminologie des machines). Classifications of motors and transformers, and definitions of motor terms adopted by the *Syndicat professionnel des Usines d'électricité*. Report presented to the Société Internationale des Electriciens. 3500 w. Bull Soc Int d Elec—Mar., 1913. No. 41512 F.

Terminology

INDUSTRIAL ECONOMY

Accident Prevention

Accident Prevention

Accident Prevention and Museums of Safety. W. H. Tolman. Abstract of a lecture at Toronto. An account of the American Museum of Safety and its work. Discussion. 3500 w. Jour Can Min Inst—Vol. XV. No. 42057 N.

The Conservation of the Worker. Arundel Cotter. Illustrated review of safety methods used by steel, railway and manufacturing companies. 3000 w. Engineering Magazine—July, 1913. No. 43094 B.

Accident Prevention in Construction Work. Suggestions for industrial safety. 3000 w. Sci Am Sup—June 7, 1913. No. 42669.

Safety Engineering. G. Gilmour. The importance of studying the prevention of industrial accidents. Ills. 6000 w. Sci Am Sup—July 19, 1913. No. 43780.

See also Protective Devices, under **ELECTRICAL ENGINEERING, Transmission, Safety Devices, under MECHANICAL ENGINEERING, Machine Works and Foundries, and Accidents, under ELECTRICAL ENGINEERING, Miscellany.**

Accounting

A System of Accounting for Electrical Contractors. F. L. Decker. Explains a system formulated by the writer. 2000 w. Elec Rev & W Elect'n—Nov. 2, 1912. Serial. 1st part. No. 37259.

Cost Accounting in the Engineering Department. Explains a system worked out for use on the Northern Pacific. 2500 w. Ry Gaz, Lond—Dec. 6, 1912. No. 38238 A.

An Outline of Mine Accounting. Henry B. Fernald. An outline of the relation of capital charges, operating expenses and deferred charges, and of assets and liabilities. 2500 w. Eng & Min Jour—Jan. 4, 1913. No. 38807.

Accounting as a basis for and a Measure of Efficiency in Business. Carl H. Nau. Address before the Cleveland Chamber of Commerce. Explains the function of a cost system and considers the fundamental principles of correct accounting. 5000 w. Jour of Acc—March, 1913. No. 40864 C.

A System of Mine Accounts. Mason T. Adams. Gives a summary of a general system, with specimen forms. 2500 w. Sch of Mines Qr—Jan., 1913. No. 40760 D.

Amortizing and Interest Charges. Louis Cleveland Jones. Considers costs

Address

of carrying unmined coal in the ground, and the economical period for exhausting mines. 2500 w. Col Engr—March, 1913. No. 40272 C.

The Accounting System of the Maryland State Roads Commission. Description of the system, taken from a paper by H. G. Shirley, read at the Am. Roads Congress. 3500 w. Engng & Con—April 16, 1913. No. 41277.

A Practical System of Mine Accounts. Mason T. Adams. Gives a summary of a general system in use in a lead zinc mine, but adaptable to any mining operation. 2000 w. Min & Engng Wld—April 5, 1913. No. 41078.

Method of Handling Metered Water Accounts at Ottawa, Kansas. Illustrates and describes the style of meter sheet and the register for water service accounts. 1000 w. Engng & Con—April 23, 1913. No. 41590.

Accounting Versus Statistics. Milan V. Ayres. Points out instances where the standard classification makes it impossible justly to compare energy, production costs and other data. Proposes changes to correct this condition. 2500 w. Elec Ry Jour—May 3, 1913. No. 41874.

How to Figure Costs in the Electrical Contracting Business. A. J. Burns. Shows the importance of correct business practice, and considers the making of estimates. 3500 w. Elec Rev & W Elect'n—May 10, 1913. No. 41962.

Foundry Calculations (Gießereikalkulation). O. Leyde. A study of the costs of material, wages, overhead, general, etc., compared with selling prices. 6600 w. Gieß Zeit—May 1, 1913. No. 42131 D.

Mining Cost Accounts of the Anaconda Copper Mining Co. H. T. Van Ells. Brief description. 3000 w. Bul Am Inst of Min Engrs—June, 1913. No. 43257 F.

An Accounting System for Coal Companies. J. C. McNeil. A brief description of a system of book-keeping in which reliance is placed on vouchers and loose-leaf forms. 3000 w. Coal Age—Sept. 20, 1913. No. 45246.

See also same heading, under **CIVIL ENGINEERING, Roads and Pavements, and under Street and Electric Railways.**

See also **Water-Works Accounting, under CIVIL ENGINEERING, Water Supply.**

Addresses

Address by the President. Sir H.

Consult Classification of the Index. See page 9.

Agriculture

Frederick Donaldson. Deals particularly with the educational system. 8800 w. *Inst. of Mech Engrs*—April 18, 1913. No. 41928 N.

Appraisals

The New Agriculture. Edward A. Rumely. With editorial note. On the application of engineering methods to food production. 4800 w. *Cassier's Mag*—Nov., 1912. No. 38362 B.

Farming with Dynamite. William Cullen. Describes the operations connected with the principles underlying the use and the appliances required. Ills. 6000 w. *Jour Chem, Met & Min Soc of S Africa*—Oct., 1912. No. 38227 E.

Review of Mechanical Cultivation (*Revue de culture mécanique*). A symposium, edited by Max Ringelmann, discussing mechanical tractors, locomotive and other types, employed in the cultivation of land. Ills. 11000 w. *Bull Soc d'Encour*—Nov., 1912. No. 39069 E. + F.

See also Motor Plows, under MECHANICAL ENGINEERING, *Automobiles*.

Apprenticeship

The Appraisal of Water Power Rights. Halbert P. Gillette. Discusses different methods of estimating. 6800 w. *Engng & Con*—Dec. 4, 1912. No. 38046.

See Valuation, under INDUSTRIAL ECONOMY.

Apprenticeship

The Apprenticeship Question. A review of this question with special reference to recent developments and in relation to engineering. 3000 w. *Eng, Lond*—Dec. 13, 1912. Serial. 1st part. No. 38527 A.

Apprenticeship Systems and Co-operative Schools in the United States. James F. Barker. A general review of past and present practice, and the needs in this field. General discussion. 10500 w. *Jour Cleveland Engng Soc*—Jan., 1913. No. 39397 D.

Training Apprentices in Machine Shop Work. Illustrates and describes a successful system evolved by the R. K. LeBlond Machine Tool Co. 1200 w. *Ir Trd Rev*—March 20, 1913. No. 40720.

Apprenticeship on the Illinois Central. Explains features of the shop apprenticeship methods and the co-operative plan. 3500 w. *Am Engr*—May, 1913. No. 41836 C.

Santa Fe Apprentice Instruction. Reuben T. Peabody. Explains the system of instruction developed. Ills. 1500 w. *Ry Age Gaz (Mech Ed)*—June, 1913. No. 42681 C.

Indenture for Machinery Molders' Apprentices. Also for agricultural and stove

molders' apprentice, and for bench and brass molders' apprentice. 1500 w. *Am Found Assn*—1913. No. 43333 N.

Study Your Apprentice Boys Carefully. G. M. Basford. An address delivered at the annual meeting of the Santa Fe Apprentice instructors, at Topeka, May 27. 4000 w. *Ry Age Gaz*—July 4, 1913. No. 43475.

Apprenticeship. Condensed abstract of information received in reply to questions sent out by a committee of the Gen. Foremen's Assn. 3500 w. *Ry Age Gaz (Mech Ed)*—Aug., 1913. No. 44263 C.

Some General Ideas on Apprenticeship and the Instruction of Foundry (Quelques idées générales sur l'apprentissage et l'enseignement de la fonderie). L. Goujon. Advocating the inclusion of foundry training in trade schools. 3500 w. *Rev de Metall*—Aug., 1913. No. 45322 H.

Arbitration

The Effect of Recent Decisions Upon the Arbitration Clause. W. Valentine Ball. Discusses the clause usually inserted in contracts for the erection of works to secure the reference of disputes to arbitration. General discussion. 9500 w. *Surveyor*. Dec. 6, 1912. No. 38239 A.

Firemen's Arbitration Award. Gives the first part of the report in part, and the award in full. 2500 w. *Ry Age Gaz*—April 25, 1913. No. 41643.

The Canadian Method of Preventing Strikes and Lockouts. Address of W. L. McKenzie King at dinner of the Ry. Business Assn. in New York, Dec. 19, 1912. 10500 w. *Bul Int Ry Cong*—April, 1913. No. 41684 G.

The Question of Compulsory Arbitration in the Railway Service, before the "Société d'Etudes Législatives" of Paris. Marcel Peschaud. 7600 w. *Bul Int Ry Cong*—April, 1913. No. 41683 G.

Can Engineers Be Trusted to Arbitrate Fairly and Intelligently between the Public Interests and the Property Interests? Extracts from and editorial notes on an article by Robert M. La Follette discussing railroad valuation work. 3000 w. *Eng News*—June 5, 1913. No. 42701.

Conciliation and Arbitration in the Building Trades of Greater New York. Charles H. Winslow. Reviews past and present, arbitration plans and what has been accomplished in the different trades. 95 pp. *Bul. U. S. Bureau of Labor Statistics*—No. 124. June 16, 1913. No. 45299 N.

See also Labor, under INDUSTRIAL ECONOMY.

Budget

What Is Involved in the Making of a National Budget. Frederick A. Cleve-

Consult Classification of the Index. See page 9.

Business Administration

land. Explains the importance and aim of the budget. 6000 w. Jour of Eff Soc—July, 1913. No. 45552 D.

Business Administration

Military History and the Science of Business Administration. Edw. D. Jones. This third and last article of a series defines six administrative principles. 3000 w. Engineering Magazine—Dec., 1912. No. 37786 B.

Chemical Industries

Chemical Industries of Belgium. Notes from a consular report by Thomas C. Norton. Information concerning sulphuric acid, nitric acid, superphosphate, guano and Thomas meal, soda, etc. 5000 w. Chem Engr—Feb., 1913. No. 40112 C. Efficiency in Chemical Industries. T. B. Wagner. Presidential address delivered before the American Institute of Chemical Engineers. Deals particularly with the manufacture of corn products in the United States. 3500 w. Met & Chem Engrg—Aug., 1913. No. 44095 C.

Chemistry.

Recent Progress in Applied Chemistry and in Engineering. James O. Handy. Address of the retiring president. Discusses recent discoveries and their applications, and recent developments in various fields of engineering. 22000 w. Pro Engrs' Soc of W. Penn—Feb., 1913. No. 40921 D.

Combinations

Concentration in German Industries, Especially in Coal Mining (Die Konzentration im deutschen Wirtschaftsleben, im besondern im Steinkohlenbergbau). Ernst Jüngst. A series of statistical tables showing the disproportionate increase, in all industrial lines, of the gigantic companies as against the small plants. 8500 w. Glückauf—Aug. 30, 1913. No. 45462 D.

Commerce

What Makes Commerce? A symposium of opinions on the importance of harbor development and dock efficiency. Ills. 6000 w. Cassier's—June, 1913. No. 42867 B.

Planning for Commerce via the Panama Canal. Charles M. Pepper. A discussion of details preparatory to the opening of the canal, the expected traffic. Ills. 3500 w. Ir Age—Oct. 16, 1913. Serial. 1st part. No. 45911 C.

Commercial Engineering

Some of the Fundamental Principles of Commercial Engineering. W. J. Larke. Introduction to a series of articles dealing with various aspects of the work of the commercial engineer. 2000 w. Gen Elec Rev—April, 1913. Serial. 1st part. No. 40984 C.

Corporations**Conservation**

Our National Resources and Our Federal Government. Discussion of the paper of R. W. Raymond, presented at the Cleveland meeting. 4000 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40163 F.

One Aid to Conservation. Walter R. Wheaton. Remarks on waste of timber and timber preservation. 2000 w. Jour Worcester Poly Inst—May, 1913. No. 42404 C.

Conservation. James Douglas. Discusses waste, especially in connection with the mining industry. 3000 w. Sch of Mines Qr—July, 1913. No. 43736 D.

The National Forests and Development of Natural Resources. Henry S. Graves. A discussion of the development of the national forests and their resources. 4500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44060 N.

The Scientific Utilization of Natural Resources. Dr. W. W. Andrews. Read before the Convention of the Union of Saskatchewan Municipalities. Discusses the utilization of the wind, clay resources, fuel production, etc. 2500 w. Can Engr—July 10, 1913. No. 43684.

The Truth About "Pinchot's Doughnuts." A. H. Ricketts. Discussion of matters relating to the conservation of natural resources in the West. 3500 w. Min & Engrg Wld—July 26, 1913. No. 43942.

See also Alaska, under MINING AND METALLURGY, *Miscellany*.

Convict Labor

See same heading, under CIVIL ENGINEERING, *Roads and Pavements*.

Co-operation.

Are We Ready for Industrial Co-operation? Fairfax Harrison. An address before the state convention of the Y. M. C. A., at Hammond, Ind., Nov. 22, 1912. 4000 w. Bul Int Ry Cong—March, 1913. No. 40915 G.

Co-partnership

Another View on the Co-partnership Question. W. T. Wardale. Discusses the relation of union labor to capital and how a successful co-partnership system can be established. 3000 w. Elec Rev, Lond—Jan. 3, 1913. No. 39138 A.

Corporations

Contribution of Industrial Combinations to National Welfare. Magnus W. Alexander. An argument that the big industrial combination, from its very nature, is capable of subserving the public good to a greater extent than of individual employers. 2500 w. Gen Elec Rev—Dec., 1912. No. 37994 C.

Cost Keeping**Cost Keeping.**

A Simple System for Procuring Cost Data. Gives details of the routine used by the National Tool Co. 1800 w. *Ir Age*—March 27, 1913. No. 40886 C.

System for Keeping Costs in a Foundry. Edward A. Bryce. Outlines a cost system operating successfully. 1800 w. *Ir Age*—March 6, 1913. No. 40336 C.

The Fallacy of Including Interest and Rent as Part of Manufacturing Cost. A. Lowes Dickinson. Additional note on this subject, with reprint of an earlier article. 3000 w. *Jour of Acc*—Aug., 1913. No. 44339 C.

See also same heading, under **CIVIL ENGINEERING, Construction**; and under **Mining and Metallurgy, Mining**.

Cost Methods

Overhead Expense Distribution. Royal R. Keely. Abstract of paper and discussion presented at the Phila. meeting. Considers methods of determining the indirect expense. Discussion. 3500 w. *Jour Am Soc of Mech Engrs*—June, 1913. No. 42957 D.

Methods of Determining Shop Costs. H. F. MacLane. Third of a series of articles on works management. Deals principally with cost figuring. 3000 w. *Elec Jour*—June, 1913. No. 43229.

A Modern Sheet-Metal Shop and Cost System. Describes methods of cost-accounting, tool and stock keeping in a Cleveland shop planned to facilitate economical production. Ills. 2500 w. *Met Work*—June 6, 1913. No. 42672.

Uniform Cost Methods in the Foundry Industry. C. E. Knoepfel. Suggestions for the elimination of cut prices. 2500 w. *Foundry*—July, 1913. No. 43412.

Economical Foundry Cost-Keeping Methods. E. W. Riker. Read before the Phila. Found. Assn. Explains how the cost of production can be accurately ascertained. 2500 w. *Foundry*—July, 1913. No. 43414.

Automatic Cost Calculations of a Coking Plant (Selbstkostenberechnung eines Kokereibetriebes). F. Korten. Explaining a cartographic cost-keeping system and its maintenance. Ills. 2500 w. *Glückauf*—Aug. 30, 1913. No. 45397 D.

Costs

Axioms Concerning Manufacturing Costs. Henry R. Towne. Sums up the results of modern experience and states the views now generally held concerning the fundamental principles which underlie accounting. 4000 w. *Jour Am Soc of Mech Engrs*—Dec., 1912. No. 38506 D.

Axioms Concerning Manufacturing Costs. Henry R. Towne's paper is discussed. 3000 w. *Jour Am Soc of Mech*

Depreciation

Engrs—April, 1913. No. 41304 D.

A Problem in the Distribution of Expense Burden. H. C. Bentley. A problem in cost finding designed to illustrate the distribution of manufacturing expenses according to principles set forth by A. Hamilton Church. 7000 w. *Jour of Acc*—July, 1913. Serial, 1st part. No. 43992 C.

Tabular Costing in Iron and Steel Works. A. Waink. Abstract from *Stahl und Eisen*. A brief outline of the system. 3000 w. *Ir & Coal Trds Rev*—July 18, 1913. No. 44043 A.

See Management, under **INDUSTRIAL ECONOMY**.

Cost Systems

A Foundry Cost System That Produces Results. Explains how a steel casting plant solved the cost-keeping problem and the economies effected. 2500 w. *Foundry*—Dec., 1912. No. 37988.

Selling Expense. P. C. N. Pickworth and Dempster Smith. An explanation of a selling cost system of approximate accuracy. 900 w. *Prac Engr*—Jan. 2, 1913. No. 39141 A.

An Easily Applied Common-Sense Cost System. W. O. Brace. First of a series of articles explaining a practical cost-keeping method, adaptable to small and large foundries. 3000 w. *Foundry*—Feb., 1913. Serial, 1st part. No. 39649.

The Need of Common-Sense Cost Systems for the Foundry. E. W. Riker. Shows the importance of an exact cost system to the foundry industry and outlines a system. 6000 w. *Am Found Assn*—Oct., 1913. No. 46261 N.

See also Cost Keeping, under **CIVIL ENGINEERING, Construction**.

Depreciation

The Use of Depreciation Data in Rate Making and Appraisal Problems. Halbert P. Gillette. Discusses the subject of depreciation and methods of analyzing maintenance expenses. 8000 w. *Engng & Con*—Oct. 30, 1912. No. 37195.

The Use of Depreciation Data in Rate Making and Appraisal Problems. Halbert P. Gillette. Discussion of the subject and explanation of a recent method, based on a new statement of the economic principle involved. 4500 w. *Elec Wld*—Nov. 2, 1912. No. 37287.

Depreciation in Engineering Works. R. E. Neale. Considers in detail the sources of depreciation and the allowance. 2200 w. *Mech Wld*—Feb. 7, 1913. Serial, 1st part. No. 39913 A.

Depreciation and Public Service Regulation. Robert H. Whitten. Discusses whether in rate regulation there should be a deduction on account of accrued de-

Economics

preciation, though it does not interfere with the efficiency of the plant. 6500 w. *Eng News*—May 8, 1913. No. 41941.

A Study in Depreciation. Dr. Louis Bell. Illustrated account of early plants for long-distance energy transmission in the United States. 1000 w. *Elec Wld*—Aug. 23, 1913. No. 44563.

Depreciation or Valuation of Properties. L. R. Pomeroy. Brief consideration of methods of determining value. 800 w. *Ry Age Gaz*—Aug. 15, 1913. No. 44402.

Depreciation: Estimated and Actual. Dr. Alex. C. Humphreys. Read before the Inst. of Gas Engrs. of Gt. Britain. 9000 w. *Engng & Con*—Oct. 8, 1913. No. 45750.

See also same heading, under **MECHANICAL ENGINEERING, Automobiles.**

Economics

Basic Economics. H. F. Stimpson. Brief discussion of the true measures of applied energy. 1000 w. *Cassier's Mag*—Oct., 1912. No. 37154 B.

The Chamber of Commerce of the U. S. A. Harry Wheeler. Presidential address before the Central Supply Assn., Chicago, Oct. 23, 1912. Deals with some of the economic problems. 5000 w. *Dom. Engng*—Jan. 4, 1913. No. 38838.

Economics of Engineering. W. A. J. O'Meara. Abstract of a lecture at Faraday House. Discusses the markets, methods of management, and technical details, etc. 5000 w. *Elect'n, Lond*—April 4, 1913. No. 41222 A.

Education

Discussion on "Industrial Education" (Committee Report), Boston, Mass., June 27, 1912. 7500 w. *Pro Am Inst of Elec Engrs*—Nov., 1912. No. 37904 F.

Cost of German Industrial Education. Gives tables compiled from official reports giving the cost. 3000 w. *Am Mach*—Nov. 28, 1912. No. 37837.

Report of the Committee on Industrial Education, 1912. Discusses the growing demand for apprentice, continuation, and industrial schools and how best to make industrial education useful. 4000 w. *Am Found Assn*—Dec., 1912. No. 38600 N.

Practical Industrial Education in Boston. Illustrated account of the equipment and methods of instruction employed at Wentworth Institute in teaching mechanical trades. 2000 w. *Met Work*—Nov. 29, 1912. No. 37944.

The Latest Technical High School. Illustrated description of a school in Cleveland, O., said to be the most complete institution of its kind in the United States. 2500 w. *Ir Age*—Nov. 28, 1912. No. 37929 C.

Education

Industrial Fellowships: Five Years of an Educational Industrial Experiment. Robert Kennedy Duncan. Gives agreements established at the University of Pittsburgh, and the Industrial Fellowships of the University of Kansas, explaining their development and success. 3500 w. *Jour Fr Inst*—Jan., 1913. No. 39356 D.

The Education of Employees. Lee Galloway. Read before the Nat. Com. Gas Assn. Discusses the subject with particular reference to the gas industry. 6500 w. *Jour of Acc*—Jan., 1913. No. 39347 C.

Conservation and Research. Herbert T. Kalmus. From *Quinn's Qr.* Discusses economies secured by scientific investigation. 3500 w. *Sci Am Sup*—Feb. 22, 1913. No. 40108.

Co-operative Industrial Education in Philadelphia. Reports notable results from trade schools co-operating with educational authorities. Ills. 2500 w. *Met Work*—Jan. 31, 1913. No. 39567.

Moving Pictures in Railway Educational Work. An account of its successful use on the Union Pacific, to teach economical firing and other lessons. 1700 w. *Am Engr*—Feb., 1913. No. 39720 C.

The Industrial Need of Technically Trained Men. Waldemar Kaempffert. Introduction to a series of articles on scientific manufacturing and the opportunities it offers. 1200 w. *Sci Am*—March 15, 1913. Serial. 1st part. No. 40449.

The Study of Modern Languages in Technical Schools. Winslow H. Herschel. Discusses the usefulness of a knowledge of foreign languages, and considers German to be preferred, on account of the technical position of Germans. 4500 w. *Eng News*—Feb. 27, 1913. No. 40237.

The Importance of Foundry Learning; the Vocation of the Foundry Engineer and his Instruction in the Technical School (Die Bedeutung des Giesserei-wesens, der Beruf des Giesserei-Ingenieurs und seine Ausbildung an der Technischen-Hochschule). E. Leber. A study of foundry economics. 6600 w. *Stahl u Eisen*—Feb. 27, 1913. No. 41400 D.

A New Departure in Mining Education. H. G. Carmichael. Brief account of instruction in connection with the High School at Sudbury, Ont. 1200 w. *Jour Can Min Inst*—Vol. XV. No. 42059 N.

Industrial Education for Miners. Frederick H. Sexton. Brief accounts of attempts to provide educational advantages for the miner to train him for

Education

responsibility. Discussion. 5500 w. Jour Can Min Inst—Vol. XV. No. 42058 N.

Trade Teaching in Foundry Practice at Wentworth Institute. E. A. Johnson. An account of the instruction in foundry work. Ills. 4000 w. Am Found Assn—May, 1913. No. 42494 N.

Vocational Training in Plumbing. Illustrated account of work in a New York City School and the results. 2500 w. Met Work—May 30, 1913. No. 42496.

Industrial Education. F. J. Trinder. Explains the work in progress at New Britain and Bridgeport, Conn. 1500 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42956 D.

Industrial Education. Five brief papers relating to several phases of the subject. The authors are Henry H. Norris, F. C. Henderschott, A. J. Rowland, Robert Sibley, John Price Jackson and J. W. L. Hale. 13,000 w. Pro Am Inst of Elec Engrs—June, 1913. No. 43214 F.

A School That Trains Boys for Shop Work. Edward K. Hammond. Describes shop and drafting-room methods of a progressive technical High School—The William L. Dickinson High School, Jersey City, N. J. Ills. 3300 w. Mach, N Y—June, 1913. No. 42566 C.

Educating Apprentices in Apprentice Schools. B. F. John. Plans for training boys who are learning the sheet metal trade. 2500 w. Met Work—June 30, 1913. No. 42964.

The Relative Importance of Principles and Practice in Education. Dr. James Douglas. Commencement address at Colo. Sch. of Mines. A review of metallurgical developments during the last forty years in Colorado. 5000 w. Met & Chem Engng—July, 1913. No. 43484 C.

Comments on Our Present Educational System. R. M. Hale. A critical review. 2500 w. Bul Soc for Pro & Engng Ed—Feb., 1913. No. 44821 N.

Four versus Five or More Years of Collegiate Education. Alexander C. Humphreys. Discusses collegiate education in preparation for the profession of engineering. 4500 w. Stevens Ind—July, 1913. No. 44326 D.

Value of the Classics in Modern Education as Viewed by an Engineer. Charles P. Steinmetz. Address before the Classical Assn. of the Middle West and South. Explains the aim of education and the value of classic literature. 2500 w. Eng Rec—Aug. 9, 1913. No. 44241.

The Effect of Cooperative Courses Upon Instructors. John T. Faig. Refers particularly to instructors in technical subjects. 3000 w. Bul Soc for Pro of Engng Ed—March, 1913. No. 44823 N.

Education

The Training of Engineering Teachers. Gardner C. Anthony. Discusses qualities desirable in the highest type of teacher. 1000 w. Bul Soc for Pro of Engng Ed—March, 1913. No. 44822 N.

Training Teachers by Apprenticeship. Samuel C. Earle. Discusses how to increase the efficiency of teachers. 2500 w. Bul Soc for Pro of Engng Ed—March, 1913. No. 44824 N.

Manual Instruction as an Educational Subject. Second Appendix to the report of the Consultative Committee on Practical Work in Secondary Schools. On the development of constructional handiwork. 6000 w. Jour Soc of Arts—Aug. 1, 1913. No. 44299 A.

The Training of Engineers Engaged on Work Associated with Sanitation. J. Radcliffe. From a paper read at the Exeter Cong. of the Roy. San. Inst. 2200 w. Surveyor—Aug. 15, 1913. No. 44716 A.

Industrial Education in Berne, Switzerland. F. P. McKibben. An account of the character of the instruction and the work done by students. 1500 w. Eng Rec—Aug. 9, 1913. No. 44245.

Teaching Mathematics to Engineering Students. Willis Whited. Suggestions as to the teaching of pure mathematics. 2500 w. Eng News—Sept. 18, 1913. No. 45219.

The Failure of Engineering Education in England. The present article considers the evidence of the failure. 1000 w. Prac Engr—Aug. 28, 1913. Serial, 1st part. No. 44914 A.

Professional Instruction of Industrial Labor as Practiced Abroad (L'istruzione professionale estera dell'operaio addetto alle industrie). G. Pincherle. A brief statement of German, American and British practice in trade schools and apprentice education. 2400 w. Industria—Sept. 7, 1913. No. 45368 D.

The National School of Arts and Measures at Paris (L'Ecole Nationale d'Arts et métiers de Paris). L. Pierre-Guédon. Chiefly a description of the machine tools installed. Ills. Serial, 1st part. 3500 w. Genie Civil—Aug. 30, 1913. No. 45356 D.

Report of the Committee on Industrial Education. P. Kreuzpointner. 6000 w. Am Found Assn—Oct., 1913. No. 46255 N.

Liberal Education and the Engineer. Arthur T. North. Discusses important elements of an engineer's training. 1200 w. Wis Engr—Oct., 1913. No. 46313 C.

European Engineering Schools. F. E. Turneaure. Describes features of schools in Germany, France, and Great Britain. 2500 w. Wis Engr—Oct., 1913. No. 46314 C.

Efficiency

Educational Media for the Advancement of Science in the United States of America (Die geistigen mittel des technischen Fortschrittes in den Vereinigten Staaten von Nordamerika) Conrad Matschoss. An account of the school, high school, and collegiate system, and the industrial and apprentice schools, etc., in the United States. Serial. 1st part. 8000 w. *Zeit des Ver deutscher Ing*—Sept. 27, 1913. No. 46043 D.

See also same heading, under **CIVIL ENGINEERING, Roads and Pavements**; and same heading, under **RAILWAY ENGINEERING, Miscellaneous**. See also **Apprenticeship**, under **Industrial Economy**.

Efficiency

Efficiency in the Manufacture of Railway Transportation. Harrington Emerson. This second installment outlines the influence of the personality of the railroad executive, as exemplified on the Pittsburg & Lake Erie R. R. 3000 w. *Engineering Magazine*—Jan., 1913. No. 38677 B.

Methods of Promoting Efficiency in Maintenance on the Pittsburgh and Lake Erie. An improved system evaluating section work on a unit basis and a record system for keeping labor and material

Efficiency in the Manufacture of Railway Transportation. Harrington Emerson. Third article of a series. Discusses selection of an organization by individual aptitude. 4500 w. *Engineering Magazine*—Feb., 1913. No. 39430 B.

Efficiency in the Manufacture of Railway Transportation. Harrington Emerson. The part played by supremely good equipment is discussed in this fourth article of a series. 4500 w. *Engineering Magazine*—March, 1913. No. 40087 B.

Individual Efficiency. Norman A. Hill. Remarks on the technical meaning of the term, and means of increasing personal efficiency. 2000 w. *Ap Sci*—Jan., 1913. No. 39947 C.

Efficiency in the Manufacture of Railway Transportation. Dr. Katherine M. H. Blackford. This is the fifth article in Mr. Harrington Emerson's series, written by request. Considers the part played by supremely good personnel. 3000 w. *Engineering Magazine*—April, 1913. No. 40911 B.

Efficiency in the Manufacture of Railway Transportation. Harrington Emerson. The practical application of the twelve principles on the P. & L. E. Ills. 4500 w. *Engineering Magazine*—May, 1913. No. 41628 B.

Efficiency

The Chemical Engineer and Industrial Efficiency. W. M. Booth. Considers methods that can be adopted in the conduct of manufacturing business. 3500 w. *Sci Am Sup*—April 5, 1913. No. 41055.

Efficiency as Applied to Mining. W. J. Crocker. Suggestions affecting mine profits. 1800 w. *Min & Engng Wld*—April 19, 1913. Serial. 1st part. No. 41362.

Efficiency in the Manufacture of Railway Transportation. Harrington Emerson. This seventh and last article of the series discusses the application of the last nine principles of efficiency. Ills. 7000 w. *Engineering Magazine*—May, 1913. No. 42491 B.

Experiences in Efficiency. Benjamin A. Franklin. First of a series of articles showing success secured by a study of workmen's tendencies. 2500 w. *Engineering Magazine*—Aug., 1913. No. 43912 B.

Efficiency and the Worker. H. R. Callaway. A discussion from the workers viewpoint. 1500 w. *Engineering Magazine*—Aug. 1913. No. 43918 B.

What Is Efficiency? W. N. Polakov and L. G. Hanmer. Discusses present day efficiency methods and the real purposes of efficiency engineering. 3000 w. *Cassier's*—July, 1913. No. 43356.

Causes of Failures in Efficiency Work. F. W. Collins. Discusses the factors that create crises and how to avoid them. 2000 w. *Engineering Magazine*—Sept., 1913. No. 44769 B.

Experiences in Efficiency. Benjamin A. Franklin. Second article of a series. Shows how production was increased by simple reorganization. 3000 w. *Engineering Magazine*—Sept., 1913. No. 44764 B.

The Effect of Governmental Efficiency Upon Efficiency in Industry. Le Grand Powers. Remarks on government accounting, and the importance of efficiency that will benefit the masses. 3500 w. *Jour of Eff Soc*—July, 1913. No. 45551 D.

Factory Efficiency. Lucian I. Yeomans. Read before the Am. Boiler Mfrs.' Assn. Discusses the essential elements of factory efficiency. 4000 w. *Boiler Maker*—Sept., 1913. No. 45215.

Experiences in Efficiency. Benjamin A. Franklin. This third article of a series discusses the problem of quality of workmanship. 3300 w. *Engineering Magazine*—Nov. 1913. No. 46304 B.

Fields for Future Expansion of Efficiency Engineering. Francis W. Collins.

Egypt

Shows the opportunities for professionally trained engineers in the principles and practice of efficient management to be practically boundless. 2000 w. *Engineering Magazine*—Nov., 1913. No. 46308 B.

The Efficiency Engineer in the Foundry. E. A. Barnes. Discusses the efficiency problems of the foundry and the best way of solving them. 1500 w. *Am Inst of Metals*—Oct., 1913. No. 46275 N.

See also Accounting, Management and Organization, under Industrial Economy; and Shop Hygiene and Shop Practice, under Mechanical Engineering, *Machine Works and Foundries*. See also same heading under Civil Engineering, *Municipal* and under Mining and Metallurgy, *Mining*.

Egypt

The Resources of Egypt. R. de Rustafjaell. Reviews briefly the physical conditions of the country, the natural productiveness of the soil, the mineral wealth, etc. 2000 w. *Jour Soc of Arts*—Aug. 1, 1913. No. 44298 A.

Engineering

The Relation of the State to the Practice of Engineering. A topical discussion. 12000 w. *Jour W Soc of Engrs*—Oct., 1912. No. 37741 D.

The Position and Prospects of the Young Mining Engineer on the Rand. Percy Cazalet. Information of interest and value to mining engineers. 3000 w. *S. African Min Jour*—Sept., 1912. (Special.) No. 37851 N.

The Philosophy of Engineering. Maurice G. Parsons, Jr. Outlines the possibilities of coöperation and discusses the opportunities presenting themselves to engineers. 5500 w. *Pro Am Soc of Civ Engrs*—April, 1913. No. 41647 F.

Professional Relations of the Engineer. A discussion before the American Institute of Consulting Engineers. 5000 w. *Eng Rec*—April 12, 1913. No. 41186.

The Human Side of Engineering. John C. Wait. A discussion of the relation of the engineer to his fellowman and his work. 6500 w. *Sib Jour of Engng*—June, 1913. Serial. 1st part. No. 43183 C.

The Engineer and His Profession. A. J. Himes. The characteristics of engineers are discussed, some of the problems of engineering, preparation useful to engineers, etc. 4000 w. *Cornell Civ Engr*—June, 1913. No. 43187 C.

A Suggestion for the Engineering Profession. William McClellan. Suggests the formation of an American Engineering Association composed of members

Engineering

elected annually from present societies. 1500 w. *Pro Am Inst of Elec Engrs*—June, 1913. No. 43213 F.

Theory and Practice in Engineering Work. Konrad Meier. The present number discusses hot water heating and matters related. 2200 w. *Heat & Vent Mag*—June, 1913. Serial. 1st part. No. 43180.

The Philosophy of Engineering. Discussion of Maurice G. Parsons, Jr.'s paper. 2500 w. *Pro Am Soc of Civ Engrs*—Aug., 1913. No. 44788 F.

The Imaginative Faculty in Engineering. Isham Randolph. Address in receiving the Institute's Elliott Cresson medal. 2000 w. *Jour Fr Inst*—Aug., 1913. No. 44543 D.

Some Tendencies and Problems of the Present Day and the Relation of the Engineer Thereto. George Fillmore Swain. President's address at the annual convention, in Ottawa, Ont., June 18, 1913. 14000 w. *Pro Am Soc of Civ Engrs*—Aug., 1913. No. 44785 F.

A Few Notes on Engineering Research and Its Co-ordination. G. H. Roberts. Describes results of researches of general interest carried out in Woolwich Arsenal, with suggestions for a 'clearing house' for handling records of research work and so avoid wasteful duplication. 115. 4500 w. *Inst of Mech Engrs*—July, 1913. No. 44324 N.

The Philosophy of Engineering. Continued discussion of the paper by Maurice G. Parsons, Jr. 1300 w. *Pro Am Soc of Civ Engrs*—Oct., 1913. No. 46344 F.

The Relation of the Business Man and Engineer to the Present Industrial Problem. Frederick L. Crawford. A discussion of the present business situation from the standpoint of a business man with some knowledge of engineering. Also discussion. 5000 w. *Brooklyn Engrs' Club*—1912. No. 46393 N.

Engineers: Their Technical and Practical Training. Sir A. Trevor Dawson. Summary of a lecture before the Jun. Inst. of Engrs. 1500 w. *Prac Engr*—Dec. 19, 1912. Serial. 1st part. No. 38870 A.

The Present Opportunities and Consequent Responsibilities of the Engineer. Alexander C. Humphreys. Reviews the opinions of other prominent engineers, and former presidents of the society, and urges co-operation of all professions for effective service. 13800 w. *Jour Am Soc of Mech Engrs*—Jan, 1913. No. 39348 D.

The Status of the Engineer. A letter from Percival M. Churchill, with editorial

Engineering Societies

comment. 4500 w. Eng News—Jan. 2, 1913. No. 38782.

The Status of the Engineering Profession. L. B. Stillwell, and Samuel Whinery. Papers read before Am. Inst. of Consulting Engrs. 4000 w. Eng News—Jan. 23, 1913. No. 39373.

Brief Review of Engineering Practice and Personal Experience in Latin America Thirty-two Years, 1880-1912. Elmer L. Corthell. 12000 w. Jour W Soc of Engrs—Dec. 1912. No. 39335 D.

The Engineer in the Building of the Republic. Isham Randolph. Brief review of the work accomplished by engineers. 5500 w. Jour Fr Inst—March, 1913. No. 40822 D.

Inaugural Address of the President. Arthur Valon. A discussion of questions affecting the engineering profession. 7500 w. Soc of Engrs—March, 1913. No. 40850 N.

Civic Fields for the Service of Men Trained as Engineers. From an address by O. V. P. Stout. Reviews some of the fields in which the engineer can render service and find employment outside of design and construction. 2500 w. Engng & Con—May 7, 1913. No. 41907.

Developing Chief Engineers in Swift's Chicago Plant. Describes the training given and the plant in which they are trained. Ills. 3000 w. Prac Engr, Chicago—Sept. 15, 1913. No. 45133.

Engineering Societies

The Verein Deutscher Ingenieure. An outline of the work and organization of the largest society of its kind. 2500 w. Engng—Dec. 20, 1912. No. 38890 A.

Engineers' Salaries

Standardizing City Engineers' Salaries. A report prepared by a committee of Munic. Engineers of the City of New York for submission to the Board of Estimate and Apportionment. 3500 w. Eng Rec—May 3, 1913. No. 41848.

Estimating

Cost-Estimating and Rate Fixing in the General Shop. Discusses methods of estimating, the relation to organization and to production in this first article. 5000 w. Engng—Feb. 7, 1913. Serial, 1st part. No. 39915 A.

The Quantity System of Estimating. Alexander Wright. Abstract of an address to the Gen. Contractors' Assn. Explains the loss occasioned by the present method, and the advantages of the new system. 3000 w. Con Rec—July 23, 1913. No. 43869.

Exhibition

The Physical Society's Exhibition of Scientific Apparatus. Brief descriptions of exhibits. 4000 w. Engng—Dec.

Factory Inspection

20, 1912. Serial. 1st part. No. 38892 A.

The Building Trades' Exhibition. Describes exhibits at Olympia. Ills. 4000 w. Engng—April 18, 1913. Serial. 1st part. No. 41767 A.

Electrical and Mechanical Engineering Exhibits at Ghent. Illustrates and describes some of the interesting exhibits. 1800 w. Engng—June 6, 1913. Serial. 1st part. No. 42884 A.

Mining Machinery Exhibition in London. Report of the opening and illustrated description of the exhibits. 33500 w. Col Guard—June 6, 1913. No. 43142 A.

The Mining Machinery Exhibition. Illustrates and describes some of the exhibits shown in London. 3500 w. Engng—June 6, 1913. Serial. 1st part. No. 42886 A.

British Machinery at Ghent. A criticism of the exhibition, and brief description of the British exhibits. 1800 w. Engr, Lond—June 20, 1913. No. 43391 A.

The Royal Show at Bristol. Illustrates and describes interesting exhibits at the Agricultural Show. 5500 w. Engng—July 4, 1913. Serial, 1st part. No. 43719 A.

The International Building Trades Exposition, Leipzig, 1913 (Von der Internationalen Baufach-Ausstellung; Leipzig, 1913). Description of the steel exhibit at the exposition, opened May 3. Ills. 4500 w. Stahl u Eisen—June 19, 1913. No. 43507 D.

A Remarkable Review of Building Methods Old and New. Robert Grimshaw. Brief illustrated account of the Leipzig Building and Trades Exposition. 1500 w. Sci Am—Aug. 9, 1913. No. 44215.

The Exposition of Architecture and Building. Illustrated account of the Leipzig exhibition. 2500 w. Sci Am Sup—Aug. 9, 1913. No. 44219.

Notes on the International Building-Trades Exhibition, Leipzig, 1913. (Betrachtungen über die Internationale Bau-fach-Ausstellung Leipzig, 1913.) Dr. M. Dietze. A general description of buildings and exhibits. Serial, 1st part. 5000 w. Der Ingenieur—July 15, 1913. No. 44636 D.

Factory Inspection

The Illinois System of Factory Inspection. Edgar G. Davies. Read at the Co-operative Safety Cong. Explains what has been accomplished in various States, legislation in Illinois, the enforcement of the laws, etc. 3500 w. Ind Wld—May 5, 1913. No. 41840.

Consult Classification of the Index. See page 9.

Filing Methods**Filing Methods**

Records for the Works Publication Bureau. A. D. Williams. Explains a system for keeping track of photographs, cuts and the literature issued by a manufacturing company. 2000 w. *Ir Age*—May 1, 1913. No. 41800 C.

Filing Systems

A Library Scheme for Catalogues and Price Lists. Detailed description. 3000 w. *Elec Rev*, Lond—Oct. 25, 1912. No. 37287 A.

A Simple System for Filing and Handling Tracings and Prints. Fred Buch. Describes a system for keeping tracings and drawings with security and convenience. 6000 w. *Engineering Magazine*—July, 1913. No. 43262 B.

Finance

The Engineer's Relation to Finance. Otis L. Williams. Remarks on changes in affairs and the increased responsibility of engineers requiring knowledge of many factors entering into the problems to be solved. 4500 w. *Sib Jour of Engng*—March, 1913. No. 40922 C.

Gold Production in Relation to Humanity; A Study of the Question: Has Gold Depreciated in Value? Eustace M. Weston. An explanation of the depreciation theory and a discussion of the effects of production on credit. 9500 w. *Jour Chem, Met, & Min Soc of S Africa*—April, 1913. No. 42871 E.

Forestry

Forest-Development and Preservation. R. H. Campbell. Read before the Assn. of Dominion Land Survs. Considers the materials trees require for growth and some adaptations necessary that the tree may make use of them. 3000 w. *Can Engr*—Aug. 21, 1913. No. 44568.

Fritz.

John Fritz. A review of his life and work, with a personal letter. 4500 w. *Jour Am Soc of Mech Engrs*—March, 1913. No. 40434 D.

Galveston

The Port of Galveston. Warren Willsey Peters. Discusses its relation to the industrial and agricultural development of the South. 2200 w. *Sci Am Sup*—Oct. 18, 1913. No. 45922.

Germany

Germany's Industrial Policy in Contrast to American Tendencies. Franz Erich Junge-Hermsdorf. A study of the differences of resources, ideals, and methods. 5500 w. *Engineering Magazine*—Feb., 1913. No. 39425 B.

Germany's Industrial Policy in Contrast to American Tendencies. Franz Erich Junge-Hermsdorf. Considers the underlying causes of Germany's progress

Industrial Diseases

in this second and concluding article. 7000 w. *Engineering Magazine*—March, 1913. No. 40081 B.

Indexing

An Extension of the Dewey Decimal System of Classification Applied to the Engineering Industries. L. P. Breckenridge and G. A. Goodenough. A complete classification for most engineering industries. 117 pp. *Univ of Ill, Bul* No. 9—Nov. 11, 1912. No. 39547 N.

Methods of Increasing the Use of Technical Literature. Louise B. Krause. A critical discussion of indexing methods, pointing out defects and remedies. 2500 w. *Eng Rec*—May 17, 1913. No. 42217.

Industrial Accidents

The Laws Applying to Industrial Accidents (*L'Application de la législation sur les accidents du travail*). A review of the French laws affecting industrial accidents. 3500 w. *Rev d'Econ Industrielle*—Dec. 20, 1912. No. 39064 N.

Industrial Chemistry

Recent Advances in Industrial Chemistry. Raymond C. Benner. Brief review of the more important recent discoveries. 1800 w. *Min & Sci Pr*—Nov. 16, 1912. No. 37718.

Manufacturing Problems. F. D. Bell. Considers numerous cases where a chemist's services are necessary in solving manufacturing problems. Ills. 2500 w. *Sci Am*—June 28, 1913. No. 43198.

Industrial Diseases

Lead Poisoning in Potteries, Tile Works, and Porcelain Enameled Sanitary Ware Factories. Alice Hamilton. A study of these industries, their dangers, sanitary conditions, extent of lead poisoning, typical cases, etc. 95 pp. *U S Bureau of Labor, Bul* 104—Aug. 7, 1912. No. 39548 N.

Hygiene of the Painters' Trade. Alice Hamilton. Information concerning the physiological effects produced by the constituents of paint, and possible legislation for the protection of painters. 66 pp. *U S Dept of Labor*—No. 120. No. 45172 N.

Pitch Workers' Cancer. Information from the second report on the draft regulations proposed showing improvements resulting in the withdrawal of the regulations. 4000 w. *Col Guard*—Aug. 29, 1913. No. 45038 A.

The Solubility of White Lead in Human Gastric Juices and Its Bearing on the Hygiene of the Lead Industries. A. J. Carlson and A. Woelfel. Report of an investigation. 3300 w. *Am Jour of Pub Health*—Aug., 1913. No. 45536 C.

Miners' Nystagmus. J. Court. Abstract of a paper read before the Midland

Consult Classification of the Index. See page 9.

Industrial Growth

Inst. of Min. Engrs. Discusses this disease and the law relating to liabilities of coal owners, giving account of investigations and results. 3000 w. Col Guard—Oct. 3, 1913. No. 45856 A.

Industrial Growth

The Growth of Modern Industrialism. Edwin C. Eckel. Gives an analysis of the factors in a natural evolution. 6000 w. Engineering Magazine—May, 1913. No. 42486 B.

Industrial Safety

Modern Social Hygienic Systems in Chemical Plants (Moderne sozial-hygienische Einrichtungen in Chemischen Werken). F. Quincke. Illustrated account of the precautions taken at the Friedr. Bayer & Co. plant near Cologne, also description of the company's welfare system. 1700 w. Zeitschr des Ver deutscher Ing—Sept. 28, 1912. No. 37442 D.

Inspection

Inspection Methods That Accomplish Maximum Good. Edw. J. Knapp. Gives practical suggestions for inspector, purchaser and manufacturer. 4500 w. Engineering Magazine—Aug, 1913. No. 43916 B.

Institute

The Institute of Metals. Report of the conference of the Institute of Metals at the Ghent Exhibition, with abstracts of papers. 5000 w. Engr, Lond—Sept. 5, 1913. Serial, 1st part. No. 45156 A.

Invention

Invention and Social Problems. Ira N. Hollis. An address delivered before the graduating class. 6500 w. Jour Worcester Poly Inst—July, 1913. No. 43995 C.

Labor

Factory Laborers (Ouvriers d'Usine). A. Abaut. A sociological study of the ordinary factory, mill or foundry laborer in his relation to the plant. Serial. 1st part. 7500 w. Rev de Metall—Oct., 1912. No. 37501 H.

Arbitration Board Makes Its Report. Report of the board which arbitrated the controversy between the eastern railways and their engine men, with editorial comment. 10000 w. Ry Age Gaz—Nov. 29, 1912. No. 37946.

The Economic Side of the Twelve-Hour Shift in the Steel Foundry. R. A. Bull. Discusses conditions and the advisability of changing to an eight-hour shift, showing that it is desirable from both a humanitarian and economic point of view. 2200 w. Am Found Assn—Dec., 1912. No. 38599 N.

Overtime Labor in the Iron Industry (Die Ueberarbeit in der Grosseisenin-

Labor

dustrie). Copy of petition presented to the Minister of Commerce and Industry by the German Iron and Steel Association. 3800 w. Stahl u Eisen—Dec. 5, 1912. No. 38411 D.

Industrial Life and Humanity. William C. Redfield. Address at the N. Y. Alumni Assn. An interesting discussion of labor conditions. 4000 w. Jour Worcester Poly Inst—Jan., 1913. No. 39438 C.

Syndicalism or Co-operation. Dr. James Douglas. A discussion of the latest and greatest labor problem. 5000 w. Engineering Magazine—March, 1913. No. 40080 B.

Co-Partnership. Aneurin Williams. A discussion of labor problems and explanation of this system and its results. General discussion. 13500 w. Jour Soc of Arts—Jan. 31, 1913. No. 39762 A.

High Cost of Living Is High Cost of Labor. A discussion of economic problems and present conditions. 6000 w. Ir Age—Feb. 20, 1913. No. 39926 C.

The Problem of the Efficiency of Labor. Howard T. Lewis. Discusses the Progressive development of economic efficiency, the attitude of labor unions, and related subjects. Pop Sci M—Feb., 1913. No. 40144 C.

Workmen's Compensation Laws in the United States. Charles E. Hodges. Abstract of a paper read before the Nat. Assn. of Cotton Mfrs. Discusses the movement. Thirteen States have adopted such laws. 3000 w. Ind Engng—Feb., 1913. No. 39748 C.

The Fortunate or Happy Conditions for a Life of Labor. Charles W. Eliot. Address at Hot Springs, Va., before the Elec. Mfrs. Club. Discusses fundamental conditions affecting the relations of employer and employee. 6000 w. Elec Rev & W Elect'n—March 22, 1913. No. 40776.

The Earnings and Hours of Labor of English Railway Servants. Information from a report of inquiry. 3400 w. Bul Int Ry Cong—March, 1913. No. 40918 G.

The Coal Strike and the Evolution of Syndicalism in England (La grève noire et l'évolution des syndicats en Angleterre). Maurice Alfassa. A comprehensive review of the labor situation in England. 22500 w. Bull Soc d'Encour—Jan., 1913. No. 40587 E + F.

Labor Legislation of 1912. Lindley D. Clark. Reviews briefly the contents of the laws passed, showing also some changes made in amendatory legislation. 263 pp. U S Bureau of Labor—Dec. 13, 1912. No. 41704 N.

Decisions of Courts and Opinions Affecting Labor, 1912. Reviews opinions of the Attorney-General, and court de-

Labor

Gives text of the law to provide for naissons. 184 pp. U. S. Bureau of Labor, No. 112—March 5, 1913. No. 42484 N.

Recent Eight-Hour Legislation. George A. King. Discusses some of the legal phases of employing labor on government contracts. 3500 w. Eng Rec—May 10, 1913. No. 41957.

Selection and Employment. Francis Lister Jandron. Discusses the possibilities due to careful selection and employment of men. 3500 w. Engineering Magazine—July, 1913. No. 43263 B.

Labor Unions and the Railroads. J. O. Fagan. Abstracted from the *N. Y. Times*. On the means used by the organizations to further their ends, and effects of the public attitude toward the situation. 3500 w. Ry Age Gaz—June 13, 1913. No. 42818.

The Rise of the Iron Moulders' International Union. H. E. Hoagland. A study in American trade unionism. 7000 w. Am Ec Rev—June, 1913. No. 43284 H.

The Question of Labor Conditions in the Iron Industry (Zur Frage der Arbeits-Verhältnisse in der Grosseisenindustrie). I. A. Woltmann. Discussion on the eight-hour day and Sunday and holiday work. II. W. Brüggmann. Discussion on labor insurance, pensions, etc. 11200 w. Stahl u Eisen—May 22, 1913. No. 43002 D.

A Pension Plan for Employees in the Machinery Trades. William Lodge. Considers the pension system basis, sources of savings, retiring age, and related subjects. 3500 w. Ind. Engng—July, 1913. No. 43459 C.

The Scientific Employment of Men. Herbert Newton. Discusses the standardizing of human character as planned by Dr. Katharine M. H. Blackford. Ills. 3000 w. Sci Am—July 26, 1913. No. 43863.

The Strike and the Commonwealth (La Grève et l'État). Maurice Bellom. A brief statement of some of the laws effecting the right to, and duration of, strikes, as enacted by various countries and states. 2400 w. Génie Civil—June 21, 1913. No. 43576 D.

Industrial Agreements. Report of the Industrial Council upon the enquiry made into certain matters connected with industrial agreements. 4000 w. Col Guard—Aug. 8, 1913. No. 44457 A.

Juvenile Labor Exchanges and Apprenticeship Bureaux in Germany. Edith Edlmann. A discussion of the apprenticeship problem and the various systems and schemes for its solution. 3500 w. Contemporary Rev—Aug., 1913. No. 44340 D.

Labor Insurance

A National Gazette of Unemployed. George Young. Outlines a scheme for State action to deal with the problem of unemployment. 3500 w. Engr, Lond—Aug. 1, 1913. No. 44323 A.

Unemployment Insurance. Editorial review of the first report on unemployment insurance. 2000 w. Engng—Aug. 15, 1913. No. 44725 A.

To What Age Does the German Ironworker Live (Wie alt wird der deutsche Eisenarbeiter)? J. Reichert. A social study comprising a résumé of statistics. 4200 w. Stahl u Eisen—July 10, 1913. No. 44604 D.

Labor Inspection and Night Labor (L'inspection du travail et le travail de nuit). L. Bidault des Chaumes. A discussion of the legality of inspection at night. 1700 w. Génie Civil—Aug. 16, 1913. No. 45351 D.

Report of the Industrial Council of the British Board of Trade on Its Inquiry into Industrial Agreements. 41 pp. U S Bureau of Labor—Bul. 133. No. 46112 N.

Ten-Hour Maximum Working-Day for Women and Young Persons. An account of legislation in different countries with discussion of matters related. 63 pp. U S Dept of Labor—Bul. 118. No. 46113 N.

A Novel Plan for Solving the Railway Labor Problem. George A. Clark. Outlines a plan for having labor represented in the management of industries. 1500 w. Ry Age Gaz—Oct. 10, 1913. No. 45778.

Suggested Means for Holding Laborers. Discussions by different writers of methods which have assisted in retaining laborers, showing that wages are not the only consideration. 4300 w. Ry Age Gaz—Oct., 24, 1913. No. 46199.

See also Shop Hygiene, under Mechanical Engineering, *Machine Works and Foundries*; and Labor, under CIVIL ENGINEERING, *Roads and Pavements*, and under Mining and Metallurgy, *Mining*.

See also Workmen's Compensation, Wages and Arbitration, under INDUSTRIAL ECONOMY.

Labor Insurance

Labor Insurance (Ueber Sozialversicherung). Friedrich v. Ehrenwerth. Discussing health, accident and old-age insurance, and the maintenance of insurance funds. Serial, 1st part. 1600 w. Oest Zeit f B u H—Jan. 4, 1913. No. 40016 D.

Sickness and Accident Insurance Law of Switzerland. Gives the Federal Law enacted June 13, 1911. 27 pp. U S Bureau of Labor—Aug. 1, 1912. No. 41715 N.

British National Insurance Act, 1911.

Consult Classification of the Index. See page 9.

Law

tional health insurance; unemployment insurance; and general. 87 pp. U S Bureau of Labor—July 15, 1912. No. 41714 N.

Law Relating to Insurance of Salaried Employees in Germany. Imperial law of Dec. 20, 1911, relating to insurance of salaried employees. 67 pp. U. S. Bureau of Labor—No. 107. No. 42483 N.

Employer's Premiums in Future Insurance against Accident among Miners (Der Unternehmerbeitrag für die künftige Unfallversicherung der Bergarbeiter). Robert Marschner. A study of the probable costs of labor insurance to the operators. 3800 w. Oest Zeit f Berg u Hütten—June 7, 1913. No. 43500 D.

Law

Legal Knowledge Essential to Engineers. W. A. J. O'Meara. Abstract of a lecture to the students of Faraday House. Discusses points in the law liable to be of interest to engineers in practice. 5500 w. Elect'n, Lond—Aug. 15, 1913. No. 44710 A.

Management

Scientific Shop Management on the Taylor System. G. C. Allingham. Describes the system of motion study introduced by F. W. Taylor, and the objects of this system. 2500 w. Elect'n, Lond—Nov. 1, 1912. No. 37389 A.

The Present State of the Art of Industrial Management. Gives the majority and minority reports of the Sub-Committee on Administration. 7500 w. Jour Am Soc of Mech Engrs—Nov., 1912. No. 37875 D.

The Duties of the Factory Superintendent. Stuart Dean. Outlines details of department operation, graphical production of records and their use, etc. 4000 w. Ir Age—Nov. 21, 1912. No. 37725 C.

Making a Success of the Machine Shop. Stuart Dean. First of a series of articles on machine shop operations. Discusses how losses may be prevented and shop methods. 4000 w. Ir Age—Nov. 7, 1912. No. 37748 C.

Plant Economy and Individual Efficiency (Betriebsökonomie und Privatwirtschaftslehre). C. M. Lewin. A study on the economic operation of factories. Diagrams. 2700 w. Zeit f Werkzeug—Oct. 5, 1912. No. 37462 D.

Production System for a 200-Employee Plant. Stuart Dean. Tenth of a series of articles. Deals with methods of lessening clerical work in an establishment having foundry and machine shop operations. 5000 w. Ir Age—Dec. 19, 1912. No. 38276 C.

Scientific Management in Isolated Plant Operation. P. R. Moses. Dis-

Management

cusses the practical operation of efficiency principles in the power-house. 3500 w. Engineering Magazine—Feb., 1913. No. 39427 B.

The Science and the Art of Management. F. G. Coburn. Urges training in the psychological principles of handling men. 1500 w. Ir Age—Jan. 23, 1913. No. 39324 C.

The Permanence of Workmen's Training. H. L. Gantt. Excerpt from discussion before the A. S. M. E. in report on the "Present State of the Art of Industrial Management." 3000 w. Am Mach—Jan. 2, 1913. No. 38736.

Efficiency Management in a Gas Tractor Plant. Explains how work is scientifically routed in works which embrace foundries, machine and erecting shops and other departments. Ills. 4000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38742 D.

Production Efficiency in Typewriter Building. Describes methods developed at the plant at Woodstock, Ill., for manufacturing, assembling, etc. Ills. 2500 w. Ir Age—Jan. 2, 1913. No. 38758 C.

Notes on the Taylor System of Organization for Machine Shops (Note sul sistema Taylor per l'organizzazione del lavoro nelle officine). Gina Scanferla. A résumé of the Taylor system of efficient production in the workshop. Serial. 1st part. 2100 w. Industria—Dec. 15, 1912. No. 39096 D.

Scientific Management in Power-Plant Operation. Percival Robert Moses. Second article describing methods followed in successful isolated plants. 4000 w. Engineering Magazine—March, 1913. No. 40084 B.

The Principles of Scientific Management. Frederick W. Taylor. Abstract of an address in Toronto. An explanation of scientific management and its principles. 3300 w. Ap Sci—Jan., 1913. No. 39946 C.

Investigating an Industry. William Kent. Discusses scientific investigation as the foundation of scientific management. 3000 w. Ind Engng—Feb., 1913. Serial, 1st part. No. 39746 C.

Practical Principles of Rational Management. A. Hamilton Church. The first of a series of articles. This paper defines three basic principles, and four great divisions of industrial activity, followed by ideas on the best design of the product. 5400 w. Engineering Magazine—Jan., 1913. No. 38678 B.

Practical Principles of Rational Management. A. Hamilton Church. This second article of a series discusses the machine, as the pivotal point in making

Management

earnings. 4000 w. Engineering Magazine—Feb., 1913. No. 39424 B.

Practical Principles of Rational Management. A. Hamilton Church. Third article of a series discussing the work and how it is handled. 6500 w. Engineering Magazine—March, 1913. No. 40085 B.

Practical Principles of Rational Management. A. Hamilton Church. This fourth article of a series considers the man. A study of personal effectiveness. 6000 w. Engineering Magazine—April, 1913. No. 40908 B.

Practical Principles of Rational Management. A. Hamilton Church. This fifth article of a series considers what to record. 5000 w. Engineering Magazine—May, 1913. No. 41627 B.

Practical Principles of Rational Management. A. Hamilton Church. Sixth article of a series discussing what to plan and when. 4000 w. Engineering Magazine—May, 1913. No. 42493 B.

Discussion of Reports of Sub-Committee on Administration on the Present State of the Art of Industrial Management. 28500 w. Jour Am Soc of Mech Engrs—March, 1913. No. 40439 D.

Relationship of Scientific Management to Labor. John P. Frey. From a paper before the West. Economic Soc. Discusses some of its unscientific features. 2500 w. Ir Trd Rev—April 17, 1913. No. 41322.

Training Engineers in the Science of Management. Bruce W. Benedict. An outline of the training given in the laboratory courses of the University of Illinois. 3500 w. Technograph—Feb., 1913. No. 41710 C.

Efficiency in Railway Management. L. W. Wallace. Shows that the railways have long given attention to economy of operation and that they are among the best managed properties in the United States. 4000 w. Indiana Engng Soc—1912. No. 41735 N.

Some Notes on the Scientific Management of Labor in Railway Maintenance of Way Departments. A. Swartz. Suggestions for efficient work. 2000 w. Engng & Con—April 16, 1913. No. 41275.

F. W. Taylor's Principles of Methodical Instruction in Work of All Sorts (F. W. Taylors Grundsätze methodischer Anleitung bei Arbeitsvorgängen jeder Art). F. Neuhaus. A brief outline of the Taylor ideas in scientific management. 4800 w. Zeit des Ver deutscher Ing—Mar. 8, 1913. No. 41459 D.

Principles of Scientific Organization in the Workshop (Principii d'organizzazione scientifica delle officine). Giulio Revere. An outline of the methods proposed by F. W. Taylor, and the motion studies of F.

Management

B. Gilbreth. 4000 w. Monit Tec—Mar. 20, 1913. No. 41533 D.

The Relation of Detailed Planning and the Cost of Production. C. A. Harrington. Gives practical outlines of a system for small shops. 3000 w. Engineering Magazine—May, 1913. No. 42488 B.

Industrial Management. Additional discussion of reports of sub-committee in administration on the present state of the art of industrial management, with the closure. 2500 w. Jour Am Soc of Mech Engrs—May, 1913. No. 42410 D.

Scientific Management. A. G. Christie. Defines the expression and discusses the aims and principles. 3500 w. Wis Engr—April, 1913. No. 42331 C.

Scientific Management. William Archie Weldin. Discusses the possibility of its application to coal mining, considering some of the advantages and difficulties. 2000 w. Col Engr—May, 1913. No. 44832 C.

The Political Economy of Production. Henri Le Chatelier. Introduction to the French edition of F. W. Taylor's book. A plain statement of the relation existing between production, wages, purchasing power and management. 4500 w. Ind Engng—May, 1913. Serial, 1st part. No. 41952 C.

Industrial Management. Editorial review of the report of the Sub-committee on Administration, appointed by the A. S. M. E. 2000 w. Engng—June 27, 1913. No. 43642 A.

Shortcomings of Small Concerns. C. A. Harrington. Considers they are not as well managed as the large companies. 2500 w. Ir Age—July 10, 1913. No. 43494 C.

System for the Drafting Office, Pattern Shop and Foundry. F. Tissington. Outlines methods of management that save time and eliminate mistakes. 2000 w. Mach, N Y—July, 1913. No. 43365 C.

System in the Engineering Department. V. J. Moncrieff. Discusses characteristics needed in the systems used in automobile plants. 6000 w. Horseless Age—July 2, 1913. No. 43442.

An Effective Follow-up System. A. L. Valentine. Explains a system for recording the progress of small manufactured parts. 3000 w. Mach, N Y—Aug., 1913. No. 44076 C.

The New Element in the Art of Management. John Calder. Defines what is known as the "scientific method," and considers the principles which underlie its successful practice. 4000 w. Stevens Ind—July, 1913. No. 44327 D.

Management. William Lodge. Suggestions from the writer's experience.

Motion Study

4000 w. Jour of Eff Soc—July, 1913. No. 45553 D.

Management. Harriet Fisher Andrew. Report of experience from a woman having charge for fourteen years of forty to forty-five men in shop work. 2200 w. Jour of Eff Soc—July, 1913. No. 45554 D.

The Tool Room in Scientific Management. Robert Thurston Kent. Shows the importance of the relation existing between the tool room and the shop as regards maximum production. Ills. 3500 w. Ir Age—Sept. 4, 1913. No. 44954 C.

Factory Labor (Travail d'usine). A. About. General remarks on the management of shops: organization, building plan, central bureau, and control. 14000 w. Rev de Metall—Sept., 1913. No. 45329 H.

"Put Your House in Order." Fred-eric A. Parkhurst. Considers the science of management as applied to the foundry. 3500 w. Am Found Assn—Oct., 1913. No. 46269 N.

The Development of Systems of Control. F. R. Carnegie Steele. The tendency toward intensified production calls for a development in the science of accounting that executives may at any time know what is the condition of the business. 4000 w. Jour of Acc—Oct., 1913. No. 46117 C.

Taylor's Principles of Management and Their Adaptations to European Conditions (Taylor'schen Grundsätze der Betriebsleitung und ihre Verwertung für europ. Verhältnisse) Herbert W. Hall. A discussion of the variance of labor conditions in Europe and America and consequential difficulties in uses of the system. Serial. 1st part. 1200 w. Schweiz Bau—Sept. 13, 1913. No. 46032 D.

See also same heading under Streets and Electric Railways, and Copartnership, Efficiency, Organization, Public Works and Wage Systems, under Industrial Economy. See also Foundry Practice, under Mechanical Engineering, Machine Works and Foundries.

Motion Study

Motion Study in the Box Shop. Robert Thurston Kent. Explains how an effort to cut down the internal transportation movements effected a 50 per cent increase in capacity. 3000 w. Ind Engng—Aug., 1913. No. 44155 C.

Micro-Motion Study in Industry. Robert Thurston Kent. Discusses the progress of efficiency-producing methods in 1912. Ills. 4500 w. Ir Age—Jan. 2, 1913. No. 38754 C.

See also Time Study, under INDUSTRIAL ECONOMY.

Organization

The Organization of Large Commercial and Industrial Establishments. Benno Orenstein. Describing the duties of the central office, and its sub-departments; purchase, engineering, factory, plant management, sales, advertising, etc. 5400 w. Engineering Magazine—Jan., 1913. No. 38681 B.

Industrial Organization. Hugo Diemer. Detailed discussion describing the methods of procedure to be followed. Also general discussion. 10,000 w. Jour Engrs' Soc of Penn—Oct., 1912. No. 38221 C.

Organization. T. C. Roberts. An outline of essentials from engineering practice. 2500 w. Met & Chem Engng—Feb., 1913. No. 39688 C.

The Formation and Organization of a Large Manufacturing Corporation. C. B. Auel. Based on a lecture prepared with the aim of explaining the subject of works management to comparatively young men. 2500 w. Elec Jour—April, 1913. No. 41213.

The Technical Man and the Steel Works. W. E. Snyder. A discussion of methods aiming at the improvement of the operating personnel. 9000 w. Pro Engrs' Soc of W Penn—March, 1913. No. 41688 D.

Orders and Methods of Handling. C. B. Auel. Second of a series of articles on works management, giving the methods in general use. 4500 w. Elec Jour—May, 1913. No. 42435.

Force Organization in the Railroad Repair Shop. Ernest Cordeau. Suggestions for the adjustment of men and functions to present requirements. 4500 w. Engineering Magazine—July, 1913. No. 43099 B.

Organizing a New-Business Department. E. L. Callahan. Offers suggestions for the organization and management of electric light and power companies. Ills. 4500 w. Elec Rev & W Elect'n—May 31, 1913. No. 42651.

Organization of an Appliance Department. B. E. Rowley. Suggestions and discussion of advantages. 8000 w. Can Elec Assn—June, 1913. No. 44820 N.

Engine House Efficiency. Extracts from a committee report at the convention of the International Ry. General Foremen's Assn. Deals with the organization, cost of repairs, operation, etc. 4500 w. Ry & Engng Rev—Aug. 2, 1913. No. 44151.

The Scientific Organization of Human Labor (L'organisation scientifique du travail humain). Jules Amar. Laboratory experiments on the fatigue of workmen

Patent Laws

engaged in several classes of occupation. Ills. 4800 w. Tech Mod—Aug. 15, 1913. No. 45336 D.

See also efficiency, under **INDUSTRIAL ECONOMY**.

Patent Laws

The Proposed Patent Law Revision. Gilbert H. Montague. A thorough discussion, from a legal standpoint, of the present patent system, reviewing and discountenancing the proposed substitute to the Oldfield Revision and Codification of the Patent Statutes. 18 pp. Harvard Law Review—1912. No. 38479 N.

Outline of the Imperial Ruling on Patent-Law Revision, models and samples of Wares Required by Law (Entwürfe der Reichsregierung zur Abänderung des Patentgesetzes, des Gebrauchsmustergesetzes und des Warenzeichengesetzes). Abstracts of proposed German laws. 11000 w. Gläfers Ann—July 15, 1913. No. 44628 D.

Recent Notes on the Study of Patent Possibilities (Neue Beiträge zur Lehre von der Patentfähigkeit). Dr. Schanze. A study of German Laws as expounded by Kohler and others. 5500 w. Gläfers Ann—Aug. 1, 1913. No. 44629 D.

Patents

Patent Experting—A New Field for Engineers. Dyer Smith. Describes the part played by an expert in a patent case; the requirements for success; the preparation, etc. 2000 w. Mach, N Y—Jan., 1913. No. 38719 C.

Protection of Intellectual Property in Relation to Chemical Industry. Dr. Leo H. Baekeland. Presidential address before the Am. Inst. of Chem. Engrs. Discusses the American patent system with special reference to chemical patents. 8000 w. Met & Chem Engng—Jan., 1913. No. 38971 C.

The Present Condition of the Patent Law Including Recent and Pending Decisions of the Supreme Court of the United States and Proposed Patent Legislation. Edwin J. Prindle. Explains decisions and cases recently decided by the Supreme Court. 6000 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41296 D.

The Benefits of Our Patent System. Jesse B. Fay. Abstract of an opinion prepared as an appendix to the report submitted to the Board of Directors of the Cleveland Chamber of Commerce. Considers the difference between monopoly and patent protection. 4500 w. Sci Am Sup—April 12, 1913. No. 41180.

Report of the Economy and Efficiency Commission on the Patent Office. L. H. Baekeland. Abstract of the report. 5000

Prices

w. Elec Wld—May 10, 1913. No. 41963.

Letters Patent in Relation to Modern Industrial Conditions. Frederick P. Fish. Read before the Am. Bar Assn. Discusses the necessity of adequate patent protection. 6800 w. Sci Am Sup—Sept. 27, 1913. Serial, 1st part. No. 45427.

See also Concrete, under **CIVIL ENGINEERING, Construction**.

Penology

Prison Labor. A collection of papers by different authors on the various problems connected with the labor of convicts. 165 pp. Am Acad of Pol & Soc Sci—March, 1913. No. 41257 F.

Pension Systems

The Burden on Electric Railways through Labor Benefit Institutions, Duties and Fees (Die Belastung der elektrischen Bahnen durch Wohlfahrts-einrichtungen, Steuern und Abgaben). Arthur Ertel. Statistics showing the heavy costs on railroads for invalidism and pensions. Serial. 1st part. 2700 w. Elek Kraft u Bahnen—Oct. 4, 1912. No. 37465 D.

Philippines

The Philippines as a Business Proposition. Lewis R. Freeman. An illustrated summary of the products and resources with the object of showing that the Philippines will become self-supporting. 3500 w. Engineering Magazine—Aug, 1913. No. 43910 B.

Public Works in the Philippine Islands under the American Régime. H. F. Cameron. Illustrated report of remarkable progress in constructing roads, bridges, and public buildings. 4000 w. Eng Rec Aug. 16, 1913. Serial, 1st part. No. 44426.

See also Philippines, under **MINING AND METALLURGY, Miscellany**.

Piecework

The Piecework Unit System of Handling Ties and Timbers. W. W. Eldridge. Extracts from a paper read before the Am. Wood Preservers' Assn. Considers the advantages and installation of the system. 2800 w. Ry & Engng Rev—Feb. 8, 1913. No. 39753.

Planning Systems

See Management, under **INDUSTRIAL ECONOMY**.

Premium System

The Premium System as Applied to the Finishing Department of a Steel Foundry. G. A. W. Gregg. Describes the method as applied where the work is largely job-work. 1600 w. Am Found Assn—Dec., 1912. No. 38617 N.

Prices

Future Contract Prices. Alex. Del Mar. Discusses the probabilities of

Consult Classification of the Index. See page 9.

Profit Sharing

change in cost of labor and materials. 3300 w. Engineering Magazine—Oct., 1913. No. 45538 B.

Profit Sharing

A Plan for Industrial Co-operation. Fairfax Harrison. Address before the Indiana Y. M. C. A. Basing wages of railway employees on gross earnings proposed as a substitute for present means of settlement. 4000 w. Ry Age Gaz—Nov. 22, 1912. Serial. 1st part. No. 37761.

Publicity

See Photography, under CIVIL ENGINEERING, *Measurement*.

Public Lands

The Engineer's Interest in Public Land Questions. George Otis Smith. Information concerning the extent of the public lands, outlining the present problem, the need of reliable classification, etc. Discussion. 6000 w. Pro Engrs' Club of Phila.—July, 1913. No. 44334 D.

Public Utilities

State Regulation of Public Utilities. Morris Knowles. Explains the benefits of regulation and discusses methods and principles to be followed. General discussion. 6000 w. Jour N Eng W-Wks Assn—Sept., 1912. No. 37915 F.

Public Utility Regulation and Its Relation to Water Conservation. Morris Knowles. Discusses legislation needed to bring about intelligent control. General discussion. Ills. 12000 w. Pro Engrs' Soc of W Penn—Jan., 1913. No. 40385 D.

Functions of a Technical Staff in the Regulation of Public Utilities. W. D. Pence. Abstract of a paper before the Indiana San. & Water Sup. Assn. Considers valuation work, service inspections, and miscellaneous investigations. 4000 w. Eng Rec—March 8, 1913. No. 40368.

The Regulation of Public Utilities in Wisconsin. Halford Erickson. Reviews the early systems of regulation and outlines the work of the Wisconsin Commission involved in enforcing adequate service, reasonable rates, and sound financial practices. Discussion. 21700 w. Jour W Soc of Engrs—May, 1913. No. 42925 D.

Bibliography on Valuation of Public Utilities. Gives a bibliography prepared in the library of the society by the library force, May 15, 1912, for use of the special committee on valuation of public utilities. 60 pp. Pro Am Soc of Civ Engrs—Aug., 1913. No. 44786 F.

Pennsylvania Public Service Company Law. Gives a new treatment of the relation of railroads, gas companies, and other public servants to the state. 3500

Research Work

w. Ry Age Gaz—Aug. 29, 1913. No. 44809.

Physical Valuation of Public Utilities. R. S. Hale. Discusses depreciation in its relations to investment, earnings, and current value. 3000 w. Engineering Magazine—May, 1913. No. 41626 B.

Commission Control of Public Utilities. From an address by John H. Roemer. A discussion of the modern practice of regulation. 4000 w. Elec Wld—Sept. 13, 1913. No. 45116.

The Two Epochs of Rate Regulation. William J. Norton. Read before the Mich. Sec. of the Nat. Elec. Lgt. Assn. Explains conditions confronting new public utilities commissions and discusses rate regulation. 3500 w. Engng & Con—Sept. 10, 1913. No. 45056.

See also Valuation, under INDUSTRIAL ECONOMY, and Rate Regulation, under RAILWAY ENGINEERING, *Traffic*.

Public Works

The Application of Engineering Practice and Principles for Controlling Municipal Activities, as Illustrated by the Work of the Street Cleaning Bureau, Borough of Richmond, New York City. The report of J. T. Fetherston, covering work done in 1911. 4000 w. Engng & Con—No. 37197.

Efficiency in Relation to Budget Methods. Summary of the report of John T. Fetherston, giving suggestions based upon the work of the street cleaning bureau of the Borough of Richmond, New York City. 2500 w. Eng Rec—Nov. 9, 1912. No. 37352.

A Successful Budget-Method Protest, Illustrated by Extracts from the Report of the Bureau of Street Cleaning, Richmond Borough, New York City. Also editorial. 6800 w. Eng News—Dec. 26, 1912. No. 38593.

Purchasing System

An Efficient Factory Purchasing System. William Gugenheim. Describes a simple method of recording orders, keeping track of deliveries and prices and making quick comparisons. 1000 w. Ir Age—July 17, 1913. No. 43751 C.

Reichsanstalt

The Work of the Reichsanstalt in 1911-12. Editorial review. Ills. 3000 w. Engng—Dec. 6, 1912. Serial. 1st part. No. 38244 A.

Research Work

Continuity. Extracts from the presidential address delivered by Sir Oliver Lodge to the British Assn. Discusses present tendencies in scientific research, and urges the belief in ultimate continuity as essential to science. 6500 w.

Routing Systems

Elect'n, Lond—Sept. 12, 1913. No. 45287 A.

Routing Systems

A New Development in Factory Study. Illustrates and describes the use of the Route Model as a method of investigation. 2500 w. Ind Engng—Feb., 1913. No. 39747 C.

Shop Schedule. Henry Gardner. Read before the Gen. Foremen's Assn. Also committee report. Describes the system introduced in the West Albany locomotive repair shops of the New York Central. 4000 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44264 C.

Scheduling

See Management, under INDUSTRIAL ECONOMY.

Specifications

The Value of Process Specifications. T. D. Lynch and F. C. Lynch. Explains the advantages of adopting process specifications by the manufacturing industries. 2500 w. Elec Jour—Aug., 1913. No. 44597.

Storerooms

A Storeroom System for a Large Plant. Gives details of the system of a large manufacturing company having main offices in one city and several factories in other cities. 3500 w. Ind Engng—Aug., 1913. No. 44156 C.

Strikes

The Canadian Plan for Preventing Strikes. W. L. Mackenzie. Abstract of an address before the Ry. Business Assn. Discusses the working of the Canadian Industrial Disputes Investigation Act. 1000 w. Ry Age Gaz—Dec. 20, 1912. No. 38343.

The Spanish Railway Strike — and After. George L. Boag. An account of the trouble, explaining its cause. 3000 w. Bul Int Ry Cong—Feb., 1913. No. 40164 G.

Sugar

The Manufacture of Sugar from Wood, and Its Economic Importance. A. Zimmermann. An account of the "Classen" process and the economic products resulting from its application. Discussion. 9000 w. Jour Soc of Arts—Dec. 6, 1912. No. 38224 A.

Manufacture of Raw Sugar in the Philippine and Hawaiian Islands. C. A. Browne. Brief review of the methods of producing sugar in these two colonies. Ills. 4500 w. Sch of Mines Qr—Jan., 1913. No. 40759 D.

Sugar By-Products

The By-Products of Sugar Manufacture and Methods for Their Utilization. C. A. Browne. Considers the utilization of the cellular refuse of beet and cane;

U. S. Commerce

of the impurities removed in clarification; and of the waste molasses. 4500 w. Sch of Mines Qr—July, 1913. No. 43738 D.

Tariff

Metal Schedule of the Underwood Tariff. Full text of "Schedule C—Metals and Manufactures of," with various administrative features of the new bill. 7500 w. Ir Age—April 10, 1913. No. 41154 C.

The New Tariff on Mineral Products. A comparison of the duties under the old tariff and the present Underwood-Simmons law which was recently put into effect. 2000 w. Min & Sci Pr—Oct. 25, 1913. No. 46331.

Time Studies

Time Study and Task Work Explained. Sanford E. Thompson. Read before the Western Economic Soc., Chicago. Explains what time studies attempt to establish and the object of scientific methods. 3500 w. Ir Age—April 24, 1913. No. 41585 C.

Time Study and Task Work. Sanford E. Thompson. An explanation of the methods of scientific time study for rate fixing. 3500 w. Ind Engng—Aug., 1913. No. 44157 C.

Notes on Time Studies. Ralph W. Langley. An account of difficulties met in establishing tasks and inducing workmen to accomplish them. 2500 w. Ind Engng—Sept., 1913. No. 44940 C.

A Classification of Materials Encountered in Excavation Operations Which Has Been Successfully Employed on Sewer Construction. William O. Lichtner. A report of time studies made as a basis of comparison. 2500 w. Engng & Con—Sept. 17, 1913. No. 45229.

How to Make a Time Study. C. E. Knoepfel. Explains the possibilities of time studies, the elements to be considered, method of making and using time studies, and related topics. 8000 w. Am Found Assn—Oct., 1913. No. 46257 N.

See also Drilling, under MINING and METALLURGY, Mining.

Trade Schools

Making Forms and Moldings at the Iserlohn Metallurgical Trade School (Die Ausbildung der Former und Metallgießer an der Königl. Fachschule für Metallindustrie zu Iserlohn). H. Krause. Gives some of the results of the work of the school. Ills. 2800 w. Giess-Zeit—Oct. 15, 1912. No. 37414 D.

U. S. Commerce

The Panama Canal and the Commerce of the United States. Emory R. Johnson. Information concerning distances and time saved and discussion of important influences expected upon U. S. trade. Ills.

Consult Classification of the Index. See page 9.

Valuation

2500 w. Sci Am—Nov. 9, 1912. No. 37338.

Valuation

Two Conflicting Theories of Valuation of Public Service Companies. Halbert P. Gillette. Discusses theories of rate regulation and the bearing upon appraisals. 3000 w. Engng & Con—Dec. 11, 1912. No. 38142.

Two Conflicting Theories of Valuation. Halbert P. Gillette. Shows that valuation must be based on market value or on the amount of investment, not based upon a combination of the two. 2500 w. Ry Age Gaz—Jan. 10, 1913. No. 38974.

The Appraisal of Water Works Properties, with Special Reference to the Reproduction Method. Douglas A. Graham. Read before the Illinois Water Sup. Assn. Outlines valuation methods used and describes the reproduction method. 3000 w. Engng & Con—April 9, 1913. No. 41197.

National Valuation Convention Urged. H. Bortin. Urges concerted action to make appraisal of railways economical, intelligent and just. 2800 w. Ry Age Gaz—April 11, 1913. No. 41173.

Comparison of Capital Values—Agriculture, Manufactures, and the Railways. A comparative study of capital investments in the United States. 38 pp. U S Bureau of Ry Economics—Bul. 39. No. 41721 N.

Modern Practice in Manufacturing Plant Appraisal. Charles W. McKay. Discusses the determination of values of the elements of a going concern. 2000 w. Mach. N. Y.—May, 1913. No. 41788 C.

Valuation and Economy in the Foundry (Wertberechnung und Wirtschaftlichkeit in de Giesserei). G. and L. Trenheit. Suggested methods of calculating values of material, producing salaries, costs, profits, etc. 6000 w. Stahl u Eisen—April 24, 1913. No. 42113 D.

Fundamentals of Valuation of Public Utilities. Editorial discussion of the theory of valuation of public utilities. 2500 w. Ry Age Gaz—Sept. 12, 1913. No. 45076.

Valuation of Buildings. Robert H. Overstreet. Gives a method of procedure. 2000 w. Eng News—Sept. 11, 1913. No. 45074.

See also same heading, under MINING AND METALLURGY, *Iron and Steel*, and Mining, under RAILWAY ENGINEERING, *Traffic*, and under STREET AND ELECTRIC RAILWAYS. See also Depreciation and Public Utilities, under Industrial Economy.

Wages.

Wages and Holidays in Central Stations. Joseph S. Ainsworth. Discusses

Wages

particularly the salaries of charge engineers and switchboard attendants in England, and the efforts made for betterment. 1500 w. Elec Rev, Lond—Feb. 28, 1913. No. 40465 A.

Piece Work as Applied to the Track Department. C. Clay. Aims to show that the system could be adopted to good advantage in work of this nature. 2000 w. Ry Engng & Main of Way—March, 1913. No. 40794.

Fundamentals of Wage Payment. B. B. Milner. Considers the time element all-important under any system, and that all systems are equally effective. 4000 w. Ry Age Gaz—April 25, 1913. No. 41641.

Salaries in Municipal Undertakings. A study of salaries paid to chief electrical engineers and their assistants and the relation existing between the salaries and the value of the undertaking. 1500 w. Elec Rev, Lond—April 11, 1913. No. 41375 A.

Pensions and Wages. Albert de Roode. Discusses pensions and gives principles for the development of a sound pension plan. 3500 w. Am Ec Rev—June, 1913. No. 43283 H.

Judicial Interpretation of the Minimum Wage in Australia. M. B. Hammond. Aims to make clear the theory underlying the minimum wage as it is finding expression in Australia and New Zealand. 10800 w. Am Ec Rev—June, 1913. No. 43282 H.

Wage Questions in Metallurgical Practice (Lohnfragen in hüttentechnischen Betrieben). Eduard Juon. A study of the systems of premiums suggested and practiced by Taylor and others, and some proposed modifications. 5600 w. Stahl u Eisen—June 12, 1913. No. 43506 D.

Union Scale of Wages and Hours of Labor, 1907 to 1912. A general summary with tables. 121 pp. U S Dept of Labor—No. 131. No. 45162 N.

Wages and Hours of Labor in the Lumber, Millwork, and Furniture Industries, 1890 to 1912. A study showing rates of wages per hour and nominal full time hours per week. 178 pp. U S Bureau of Labor—Bul. 129. No. 45514 N.

The Determination of Wages in the Silesian Coal District (Ueber Lohnzahlung im schlesischen Steinkohlenbergbau). W. Nimptsch. The wage rate for the various classes of workmen and its determination. 6400 w. Glückauf—Aug. 30, 1913. No. 45398 D.

Wages and Hours of Labor in the Cotton, Woolen, and Silk Industries, 1890 to 1912. A general summary. 206 pp. U S Dept of Labor—Bul. 128. No. 46104 N.

Consult Classification of the Index. See page 9.

Wage Systems**Wage Systems**

A Simple Bonus System and Its Results. W. L. Myles. Reports its operation by Standard Motor Construction Co., Bayonne, N. J. 2000 w. *Ir Age*—Jan. 2, 1913. No. 38756 C.

The Payment of Employees in Cash. Description of the method used on the Pennsylvania lines, west. 3000 w. *Ry Age Gaz*—Jan. 31, 1913. No. 39598.

Bonus and Rating for Works' Executives. John Nelson. Explains system developed by The Royal Typewriter Co., Hartford, Conn., for rewarding efficiency and reducing remissness. 2500 w. *Ir Age*—May 15, 1913. No. 42082 C.

Casting Cleaners' Wages on the Premium Basis. A. W. Gregg. Read before the Am. Found. Assn. Explains the method adopted in a large western steel foundry. 2000 w. *Foundry*—May, 1913. No. 41852.

Profit sharing; Some Practical Methods in Modern Industries (La participation aux bénéfices; Les méthodes pratiques dans l'industrie moderne). Maurice Bellom. A summary of eleven basic methods in use in France and their applications. 6600 w. *Tech Mod*—May 1, 1913. No. 42176 D.

A Good Showing Under the Bonus Plan of Pay. W. L. Myles. Shows how lower costs, higher wages and greater efficiency were obtained. 1800 w. *Ir Trd Rev*—Aug. 7, 1913. No. 44227.

Piecework and Bonus Systems of Wages Payment. Discusses the various systems, their difficulties and benefits. 3000 w. *Elec Rev, Lond*—Aug. 8, 1913. No. 44444 A.

Piece Work System Applied to City Forces. J. E. Tupper. An account of work carried out at Pomeroy, Wash., installing a sewerage system, and showing the practicability of piecework payment. 2500 w. *Munic Engng*—Aug., 1913. No. 44391 C.

Premium, Piece Work, and the Expense Burden. A. Hamilton Church. An inquiry into wages and works cost under various systems. Charts. 6000 w. *Engineering Magazine*—Oct., 1913. No. 45539 B.

Bonus Systems and the Expense Burden. A. Hamilton Church. Considers earnings and costs under the Gantt and Emerson scales. Graphic charts. 4500 w. *Engineering Magazine*—Nov., 1913. No. 46305 E.

Scientific Management and the Wage Problems. C. Bertrand Thompson. Condensed from paper read at the Management Conference of the W. Ec. Soc. Re-

Workmen's Compensation

views history of wage systems. 4000 w. *Ind Engng*—Oct., 1913. No. 45879 C.

The Introduction of Piece Rates in the Wage System of Shop Workers (Die Einführung der stückzeit in die Lohnordnung der Werkstattnarbeiter) Herr Fuchs. Explaining the system, methods of introduction, and examples of practice. 4000 w. *Glaser's Ann*—Sept. 15, 1913. No. 46014 D.

See also Co-Partnership, under INDUSTRIAL ECONOMY.

Waste

The New Industry. L. W. Ellis. Estimates that the replacement of men and animals by power and machinery will prevent the waste of one-fifth of our food, thereby lowering considerably the cost of living. Ills. 2500 w. *Cassier's*—June, 1913. No. 42863 B.

Welfare Work

Employers' Welfare Work. Elizabeth Lewis Otey. A study of work done for the benefit of employees in establishments noted for welfare work, discussing the field for such work. 76 pp. *U S Dept of Labor*—No. 123. No. 45161 N.

The Welfare Work on One City System. H. A. Bullock. Abstract of paper read before the Am. Elec. Ry. Assn. An account of the work in this field by the Brooklyn Rapid Transit System. 3000 w. *Elec Ry Jour*—Oct. 16, 1913. (Daily Ed.) No. 45929.

Workmen's Compensation

Accident Prevention and Workmen's Compensation. Fred C. Schwedman. Deals with employers' liability and compulsory insurance. Ills. 7500 w. *Pro St Louis Ry Club*—Oct. 16, 1912. No. 37683.

The Washington Workmen's Compensation Act and the Results of Its First Year of Administration. L. R. W. Allison. Notes from a study made of this law and its administration. 2500 w. *Eng News*—May 15, 1913. No. 42094.

Kentucky Mine's and Workmen's Compensation. K. U. Meguire. Describes the advantage of that form of compensation which divides the losses evenly among the operators of the state, regardless of the mine where the accident occurred. 2500 w. *Coal Age*—June 14, 1913. No. 42837.

Workmen's Compensation Problems. H. W. Gartrell. A discussion of Australian mining law. 1000 w. *Min & Sci Pr*—July 19, 1913. No. 43854.

The Washington Compensation Act. John H. Wallace. Information concerning the first year's operations of the first compulsory workman's compensation system in America. 3000 w. *Pro Am Min Cong*—Nov. 25-29, 1912. No. 44069 N.

Consult Classification of the Index. See page 9.

Workmen's Compensation

I. The Washington Compensation Act. John H. Wallace. II. Workmen's Compensation. Articles by Edward T. Bent, David Ross, and S. A. Taylor. 12000 w. Pro Am Min Cong—1912. No. 46186 N.

Workmen's Compensation

Workmen's Compensation. Papers by Edward T. Bent, David Ross, and S. A. Taylor, discussing this question. 8500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44070 N.

MARINE AND NAVAL ENGINEERING

Anchor Line

Anchor Line

The Story of the Anchor Line. Illustrated review of its history. 3000 w. Marine Engr & Nav Archt—Aug., 1913. No. 44310 A.

Armor

Armor and Ships. John W. Gulick. A brief résumé of twenty years progress and its effect on coast defense. 4000 w. Jour U S Art—Nov.-Dec., 1912. No. 38649 D.

Ash Discharger

The Underwater Horizontal Hydraulic Ash Discharger on the U. S. Colliers Proteus and Nereus. F. P. Palen. Drawings and description of the dischargers installed. Ills. 2500 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45166 H.

Ash-Expellers

Hydraulic Ash-Expeller for Ships. Illustrated description of under water-line ash expellers for trans-Atlantic liners and the operation. 3500 w. Engng—May 16, 1913. No. 42536 A.

Auxiliary Units

Development in Auxiliary Units Between Exhaust Pipe and Boiler. Paper by William Weir is discussed. 11000 w. Trans Inst of Engrs & Shipbldrs in Scotland—Oct. 22, 1912. No. 40851 N.

Barges

Methods and Cost of Barge Construction of Creosoted Lumber at U. S. Boatyard, Fountain City, Wis. C. W. Durham and A. E. Hageboeck. Describes the material and details of construction. Ills. 2000 w. Engng & Con—Dec. 18, 1912. No. 38311.

Battleship Equipment

The Electrical Equipment of a Modern Battleship. H. A. Hornor. Suggests certain modifications to the present equipment, based on land usages and their adaptation for marine purposes. Ills. 3500 w. Jour Fr Inst—Aug., 1913. No. 44541 D.

Battleships

Dreadnoughts in Course of Construction and a Forecast on Super-Dreadnoughts (Unsere Schlachtschiff-Neubauten und einige Zukunfts-Ueberschlagschiffe). Viktor Lazarus. Reviews present construction types, and tendencies toward future designs. Ills. 2000 w. Zeit d Oest Ing u Arch Ver—Oct. 11, 1912. No. 37437 D.

U. S. S. Arkansas. Henderson B. Gregory. Report of contract-trial per-

Battleships

formance. Ills. 1500 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38292 H.

Repairs to the U. S. Naval Dispatch Vessel "Dolphin." Illustrated account of extensive renewal of structural steel in the machinery spaces, due to corrosion. 1000 w. Eng News—Dec. 26, 1912. No. 38586.

The First Italian Dreadnought "Dante Alighieri." Illustrated description of a battleship of the all-big-gun type and of its equipment. 1500 w. Int Marine Engng—Dec., 1912. No. 37969 C.

The Injury to the Hull of the U. S. S. "Arkansas" by Grounding. Illustrated description of the accident and repairs, comparing with the injury to the "Titanic." 1500 w. Eng News—Sept. 4, 1913. No. 44983.

Progress of Warships and Machinery Under Construction in England. Report of the progress in England during the last six months. 1200 w. Engr, Lond—Jan. 17, 1913. No. 39484 A.

The French Dreadnoughts Paris and France. Illustrated description of the launching of these two vessels, and of the design. 2200 w. Engr, Lond—Jan. 10, 1913. No. 39266 A.

The Brazilian Battleship "Rio de Janeiro." Illustrated detailed description of this vessel and its equipment, with discussion of features of the design and matters related. 2 plates. 4500 w. Engng—Jan. 24, 1913. No. 39796 A.

The Arrangement of the Machinery in Warships. Giuseppe Rota. Trans. from the Italian. Gives diagrams illustrating the successive typical arrangements followed in the Italian Navy from 1858, with remarks. 1200 w. Engng—Feb. 14, 1913. No. 40135 A.

The French Destroyers "Fourche" and "Faulx." Illustrations and principal particulars of the two vessels recently built. 2500 w. Engr, Lond—Feb. 7, 1913. No. 39921 A.

Recent Development in Battleship Type. Alan H. Burgoyne. Read before the Inst. of Nav. Archts. Reviews the rapid evolution of type in progress, analyzing the reasons that are leading to a closer international unity of design. 4500 w. Engng—March 14, 1913. No. 40823 A.

The Influence of Air Pumps on the Military Efficiency of Turbine-Driven Warships. D. B. Morison. Read before

Consult Classification of the Index. See page 9.

Battleships

the Inst. of Naval Archts. States the requirements and illustrates and describes types of air pumps. 4000 w. Engng—March 14, 1913. No. 40824 A.

Great Britain's Mighty Warships. Information concerning their engineering features. Ills. 2500 w. Can Engr—March 6, 1913. No. 40412.

Multiple Gun-Turrets in Warships. Illustrated description of the arrangement of guns on battleships recently completed for Italy, Austria, and France. 1600 w. Engng—Feb. 28, 1913. No. 40485 A.

Recent Warships for the French Admiralty. Illustrates and describes the Paris, the France, and destroyer Fourche. 2500 w. Int Marine Engng—March, 1913. No. 40288 C.

Launch of the Andrea Doria. Illustrations with brief description of the latest Italian dreadnought. 700 w. Engr, Lond—April 11, 1913. No. 41396 A.

The Indiscriminate Purchase of Warships by Probable Belligerents. Critical discussion of British built warships for other countries and transactions of warship sales. 2000 w. Engr, Lond—April 4, 1913. No. 41242 A.

Battleship Construction in the year 1912 and the Growth of Naval Machine Shops (Der Kriegsschiffbau in Jahre 1912 und die Entwicklung der Kriegsschiff-Maschinenanlagen). Herr Kraft. Part one reviews naval construction in Germany and England. Serial. 1st part. 1800 w. Die Turbine—April 5, 1913. No. 42151 D.

Twin-Screw River Gunboat for China (Doppelschrauben-Flusskanonenboot für China). Detailed description of shallow-draft vessel for river service, built at the Vulcan Yards, Hamburg. Ills. 2200 w. Zeit des Ver deutscher Ing—April 19, 1913. No. 42139 D.

H. M. Torpedo Boat Destroyers "Shark," "Sparrowhawk," and "Spitfire." Illustrates one of the three vessels and the twin-screw Parsons impulse and reaction turbines, giving description. 1000 w. Engng—June 6, 1913. No. 42885 A.

The French Battleships "Provence" and "Bretagne." Brief descriptions of two recently launched vessels. Ills. 1500 w. Engr, Lond—May 23, 1913. No. 42758 A.

The Most Recent Tendencies in Naval Construction (Les tendances les plus récentes de la construction navale). Max Bahun. A description of modern Dreadnoughts built by the naval powers. Ills. 11400 w. Tech Mod (Supplement)—June 15, 1913. No. 43073 D.

The French Battleship "Courbet." Illustrations with brief description. 600 w. Engng—July 11, 1913. No. 43902 A.

Boilers

The French Dreadnought Jean Bart. Illustrated description, with report of trials. 1400 w. Engr. Lond—June 27, 1913. No. 43649 A.

The French Destroyer Magon. Brief illustrated description. 500 w. Engr, Lond—June 20, 1913. No. 43394 A.

Armored River Monitors for Brazil. Drawings and description of the first of three vessels under construction. 1500 w. Engr, Lond—June 20, 1913. No. 43397 A.

Steam Trials of the Chilean Torpedo-Boat Destroyer "Almirante Lynch." Brief description of the ship and report of trials. 800 w. Engng—July 18, 1913. No. 43967 A.

The Japanese Battle-Cruiser "Kongo." Illustrated description of the most powerful armored cruiser afloat. 1000 w. Sci Am—Aug. 16, 1913. No. 44352.

The New Spanish Battleships. Information concerning the Spanish company responsible for these battleships, and illustrated description of the España, recently completed, and its mechanical equipment. Plate. 2500 w. Engng—Aug. 8, 1913. No. 44461 A.

Notes on Battleships (Mitteilungen aus Kriegsmarinern). A general review of the increased naval strength of the several leading countries. Ills. 6000 w. Schiffbau—July 9, 1913. No. 44632 D.

The First Triple-Turreted Warships. Gives illustrated descriptions of the Italian battleship, "Dante Alighieri," and the Austrian battleship, "Viribus Unitis." 2500 w. Marine Engr & Nav Archt—Sept., 1913. No. 45032 A.

Developments in Battleship Design. Editorial on the launch of the Queen Elizabeth, and its design. 2500 w. Engng—Oct. 17, 1913. No. 46247 A.

See also Cruisers, under MARINE AND NAVAL ENGINEERING.

Boathouses

Concrete Pontoons for a Boathouse. D. C. Findlay. Illustrated description of the constructional features of watertight boxes of concrete serving as pontoons under a floating boathouse. 1200 w. Concrete-Cement Age—Sept., 1913. No. 45250.

Boats

See also Reinforced Concrete, under MARINE AND NAVAL ENGINEERING.

Boilers

Recent Experiences of Babcock & Wilcox Boilers for Marine Purposes. James H. Rosenthal. Read before the Inst. of Marine Engrs. Reviews the development of this type of boiler. Ills. 3000 w. Mech Engr—March 14, 1913. No. 40816 A.

Practical Marine Boiler Design. John

Bulkheads

Gray. Information for apprentices and young journeymen boiler makers, with practical questions. Ills. 2500 w. Boiler Maker—April, 1913. Serial. 1st part. No. 41170.

Practical Notes on the Design and Construction of Marine Boilers. A detailed consideration of points which make for efficiency in working and lessen the susceptibility to defect. 2000 w. Mech Wld—July 11, 1913. Serial, 1st part. No. 43897 A.

Bulkheads

Note on the Strength of Watertight Bulkheads. A. J. Murray. Considers some of the problems needing investigation in regard to the strength of bulkheads, and the methods of calculating. 1500 w. Int Marine Engng—Dec., 1912. No. 37970 C.

The Watertight Subdivision of Ships. Discussion of J. Bruhn's paper. 6000 w. Trans Inst of Engrs & Shipbldrs in Scotland—Dec. 17, 1912. No. 40852 N.

Watertight Subdivision. Arthur R. Liddell. Germany's views on the subject. Reviews Prof. Flamm's paper and the discussion. 1600 w. Engr, Lond—May 23, 1913. No. 42756 A.

Water Tight Bulkheads and Their Strength. Discusses the part the bulkhead plays in the structural strength of the vessel. 1800 w. Marine Engr & Naval Archt—Oct., 1913. No. 45753 A.

Canal Boats

Canadian Canaler Glenmavis. Drawings and description of an Irish-built freighter for lake trade. First to be built on the Ballard system. 800 w. Marine Rev—Aug., 1913. No. 44283 C.

Cargo Ship

The Cargo Ship "France." Illustrated detailed description of a vessel built of steel throughout and propelled by internal-combustion engines. Plate. 2500 w. Engng—Oct. 10, 1913. No. 45982 A.

Cargo Steamer

A Geared Turbine Cargo Steamer. Details of the installation are illustrated and described, and report of competitive trial is given. 1600 w. Engr, Lond—March 7, 1913. No. 40711 A.

Cavitation

On the Criterion for the Occurrence of Cavitation. Dr. L. Gumbel. Read before the Inst. of Naval Archts. Discusses briefly the cavitation in screw-propellers and on what it depends. 1500 w. Engng—July 18, 1913. No. 43965 A.

Colliers

U. S. Fleet Collier Orion. R. L. Irvine. Illustrated description of the vessel with report of trials. 6000 w. Jour.

Cruisers

Am Soc of Naval Engrs—Nov., 1912. No. 38300 H.

Self-Discharging Collier. Frederick C. Coleman. Illustrated description of the steamer Herman Sauber, constructed with belt conveyor for unloading. 1500 w. Marine Rev—Dec., 1912. No. 38161 C.

See Ship Coaling, under MARINE AND NAVAL ENGINEERING.

Compasses

The Sperry Gyro Compass. Brief explanation of the theory and illustrated description of the development. 3800 w. Elec Rev, Lond—June 6, 1913. No. 42875 A.

Compensation of Compasses. William C. Ward. A study of the influences which affect the compass on iron and steel vessels. 3500 w. Marine Rev—July, 1913. No. 43696 C.

The Problem of Directing Modern Ships and Some Instruments for Aerial Navigation (Problème de la direction des navires modernes et des appareils de navigation aérienne). L. Mascart. Outlines the principles and operation of the dygograph. Ills. 6800 w. Mem Soc Ing Civ de France—June, 1913. No. 45301 G.

Connecting-Rods

The Design of Marine-Engine Connecting-Rods. A. M. Daniels. Gives tables and calculated data for eight engines, suggesting a systematic method of calculation. 1000 w. Mech Wld—April 4, 1913. Serial. 1st part. No. 41233 A.

Corrugated Ship

The Corrugated Ship. G. S. MacIlwaine. Explains the origin of the idea, describes the vessel, states the claims made, considers the effect of corrugations, advantages claimed, with suggestions. Also general discussion. Ills. 9800 w. Jour Roy U Serv Inst—Nov., 1912. No. 38222 N.

Cruisers

The Chinese Training Cruiser "Chao Ho." Illustrated description of the vessel and its equipment, with report of trials. 1500 w. Engng—March 28, 1913. No. 41142 A.

The Japanese Battle-Cruiser "Kongo." Brief description with report of trials. Ills. 1800 w. Engng—May 23, 1913. No. 42778 A.

New Chinese Training Cruiser "Ying Swei." F. C. Coleman. Illustrated detailed description with report of trials. 1000 w. Int Marine Engng—June, 1913. No. 42599 C.

The Japanese Cruiser "Kongo" (Le Auirassé-Croiseur japonais "Kongo"). M. Gouriet. General description, offensive, defensive and propulsive power and

Consult Classification of the Index. See page 9.

Cunard Line

results of trials. Ills. 2400 w. Genie Civil—July 19, 1913. No. 45340 D.

Cunard Line

The Story of the Cunard Line. Historical review, with illustrations of early and recent types of vessels. 3000 w. Marine Engr—May, 1913. No. 41990 A.

Davits

The Babcock and Wilcox Boat-Lowering Gear. Drawings and descriptions of means of lowering boats into the water on the lee or protected side. 2500 w. Engng—Aug. 15, 1913. No. 44723 A.

Deck-Houses

On Large Deck-Houses. J. Foster King. Read before the Inst. of Nav. Archts. Discusses features of design. Ills. 2500 w. Engng—March 28, 1913. No. 41143 A.

Destroyers

Greek Torpedo-Boat Destroyers "Lion," "Panther," "Hawk," and "Eagle." Illustrates and describes one of four vessels recently purchased by the Greek Government from a British firm. 1200 w. Engng—Nov. 8, 1912. No. 37641 A.

An Armoured and Semi-submersible Destroyer. Hector C. Bywater and Maurice Prendergast. Description, comparisons, and comments on a projected destroyer for the Russian Navy. Ills. 2800 w. Shipbldr—June, 1913. No. 43057 C.

The Greek Torpedo Boat Destroyers of the "Lion" Class. Illustrated account of four ships that have withstood seven or eight months of hard work under war conditions. Plate. 1800 w. Engr, Lond—July 18, 1913. No. 43971 A.

The French Destroyer "Commandant Rivière." Illustrated description of one of the most successful vessels of her class with report of official trials. 1800 w. Engr, Lond—Aug. 15, 1913. No. 44730 A.

The Chilean Torpedo-Boat Destroyer "Almirante Lynch." Illustrated description of one of six similar vessels, which will form a flotilla of the largest torpedo-boat destroyer in the world. Plate. 2500 w. Engng—Sept. 12, 1913. Serial, 1st part. No. 45402 A.

U. S. S. Cassin and Cummings. Henderson B. Gregory. Description and trial performance. Ills. 5000 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45165 H.

Diesel Engines

Reversing the Order in Diesel Marine Engines (Sull'inversione di marcia dei motori Diesel marini). G. Supino. Problems in reversing the firing order in four-cycle engines for astern movements. Ills. Serial. 1st part. 2800 w. Industria—Nov. 3, 1912. No. 37530 D.

Dredge Recorder

The "Selandia" and the "Jutlandia" (Le "Selandia" et le "Jutlandia"). M. Gouriet. Description of two Diesel-engined vessels for the service of the Danish East Asia Company. Ills. 3700 w. Genie Civil—Nov. 30, 1912. No. 38491 D.

The Starting of Diesel Marine Engines. Illustrates and describes various types of starting gear and their working. 3000 w. Engr, Lond—Jan. 10, 1913. No. 39267 A.

Results of First Voyage of the Oil-Engined Ship "Christian X." Information from a report to the Hamburg-Amerika Line on the completion of her maiden trip to Havana. 1200 w. Engng—Jan. 3, 1913. No. 39158 A.

A New Canadian Oil Engined Ship. Drawing and description of the "Fordonian," propelled by two-stroke cycle Diesel oil-engines. 1200 w. Can Engr—Jan. 23, 1913. No. 39407.

The Diesel Engine as Motive Power in the Merchant Marine, with Special Reference to the First Successful Motor Ship, "Christian X." Ole K. Olsen. Gives a brief resumé of the development of the internal combustion engine, and detailed description of its application on the vessel named. 5000 w. Jour Assn of Engng Marine Engines (Sullo stato attuale dell'applicazione dei motori Diesel alla marina). G. Supino. Review of ships so equipped, and the possibility of further application. Ills. 4800 w. Rivista Marittima—Nov., 1912. No. 40621 E + F.

See also Fuels and Motor Ships, under MARINE AND NAVAL ENGINEERING.

Docking

Reducing Cost of Docking Work. G. A. Bisset. An account of the methods employed at the Portsmouth navy yard and some of the results. Ills. 2200 w. Marine Rev—July, 1913. No. 43693 C.

Docks

The New Gladstone Dock at Liverpool. Information showing the demand for increased dock accommodation and reviewing recent developments, with an illustrated description of the construction of the new Gladstone dock. 5000 w. Engng—July 4, 1913. No. 43717 A.

The New Gladstone Dock, Liverpool. Illustrations and interesting particulars of this great dock, recently completed. 2500 w. Engr, Lond—June 27, 1913. No. 43648 A.

Dredge Recorder

A Dredge Director and Recorder. Illustrated description of an apparatus invented by Uldric Thompson and H. S. Taft for the accurate direction of the hy-

Dredges

draulic and bucket types of dredges. 1500 w. *Sib Jour of Engng*—March, 1913. No. 40923 C.

Dredges

The United States Red River Hydraulic Dredge Waterway. Illustrated description of this steel, self-propelled hydraulic dredge and its propelling and dredging machinery. 1500 w. *Int Marine Engng*—Nov., 1912. No. 37170 C.

Power Distribution and Buckets on Self-Acting Dredges (*Kräfteverteilung und Greifen bei Selbstgreifern*). Herr Pfahl. Describes the transmitting system, operating devices, and bucket types in use on various dredges. Ills. Serial. 3800 w. *Zeitschr des Ver deutscher Ing*—Dec. 14, 1912. No. 39035 D.

Suction, Transporting, and Dumping Dredge Built by the Conrad Works, Harlem (*Draguesucuse-porteuse-refouleuse construite par les Ateliers Conrad, de Haarlem*). Jean Guerin. Details of pumping dredge built for the Argentine Republic. Ills. and plate. 3000 w. *Genie Civil*—Jan. 18, 1913. No. 40069 D.

Innovations in the Construction of Scoop Dredges (*Neuerungen im Bau von Löffelbaggern*). R. Richter. Describes improvements made in recent German models. Ills. 2500 w. *Zeit des Ver deutscher Ing*—March 29, 1913. No. 41466 D.

Two 15-Yard Dipper Dredges for Panama. Illustrated description of two of the largest dredges ever built. 1500 w. *Int Marine Engng*—May, 1913. No. 41897 C.

Modern Practice in the Construction of Scoop Dredges (*Der heutige Stand im Bau von Löffelbaggern*). Herr Wintermeyer. An outline of methods practiced in recent designs. Ills. 2100 w. *Glückauf*—April 19, 1913. No. 42117 D.

Col. M. B. Adams—A 4-Yard Dipper Dredge. Arthur F. King. Illustration, with description of a dredge in operation on the Ohio River. 2500 w. *Int Marine Engng*—July, 1913. No. 43417 C.

Watkins Rotary-Spud Dredger. Illustrated description, with explanation of the working. 2000 w. *Engng*—Aug. 15, 1913. No. 44728 A.

An Electric Hydraulic Dredge. Illustrates and describes an electrically operated suction dredge. 1500 w. *Eng News*—Aug. 28, 1913. No. 44885.

Method and Cost of Operating Hydraulic Pipe-Line Dredges in the Upper Mississippi River. Charles W. Durham. Deals with work in connection with the improvement of the Upper Mississippi River. Ills. 3500 w. *Engng & Con*—Sept. 24, 1913. No. 45456.

Electric Power

Bucket Ladder Excavators on the Spanish Canal Alfons XIII., from Seville to the Atlantic. Illustration, with description of the construction and operation. 1200 w. *Engng & Con*—Sept. 3, 1913. No. 44975.

See also Dredging, under MINING AND METALLURGY, *Gold and Silver*, and Dredging and Levees, under Civil Engineering, *Waterways and Harbors*.

Dry Docks

New Dry Dock at Manitowoc. Illustrated description of a dock having a lifting capacity of 6000 tons and that will handle a 500-ft. vessel. 1000 w. *Marine Rev*—March, 1913. No. 40652 C.

25,000-Ton Floating Dock for the Vulcan Yards, Hamburg (25,000-Tons-Schwimmdock der Vulcan-Werke, Hamburg). Herr Leucke. Plans and details of construction. Ills. 2400 w. *Schiffbau*—Feb. 12, 1913. No. 40551 D.

12000-Ton Floating Dry Dock at Seattle. Illustrated description of a dock of the "Rennie" type, the pontoons being of timber and the walls of steel. 1200 w. *Int Marine Engng*—July, 1913. No. 43419 C.

"Dreadnought" Floating Dock for the British Battleships. Frederick C. Coleman. Illustrated description of a dock of the "box" type. 1500 w. *Sci Am Sup*—Sept. 20, 1913. No. 45234.

The New Graving Dock "Gladstone" at the Port of Liverpool (*La nouvelle forme de radoub "Gladstone," du Port de Liverpool*). General description with dimensions. Ills. and Plate. 1700 w. *Genie Civil*—Aug. 16, 1913. No. 45349 D.

Electrical Machinery

Electrical Deck Machinery on the SS. "Fauvette." Illustrates and describes electrically driven auxiliary machinery on a vessel in service between London and Bordeaux. 1000 w. *Elec Rev, Lond*—Jan. 3, 1913. No. 39137 A.

Electric Power

The Generation, and Electrical Transmission of Power for Marine Transportation. William P. Durnall. Reviews the development of mechanical power as applied to propulsion, describing the system installed on the "Jupiter." 6000 w. *Soc of Engrs*—Nov. 4, 1912. No. 37816 N.

An Electrically Propelled Fireproof Passenger Steamer. William T. Donnelly and George A. Orrok. Aims especially to call attention to conditions on excursion and river passenger boats, and the need of bringing them up to the standards of present engineering practice. Ills. 3500 w. *Soc of Nav Archts & Ma-*

Engine Balancing

rine Engrs, No. 8—Nov. 21, 1912. No. 37691 N.

Some Special Applications of Electricity on Warships. A. P. Pyne. Abstract of paper read before the Newcastle Sec. of the Inst. of Elec. Engrs. Discusses problems due to conditions on shipboard. 2500 w. Elect'n, Lond—April 4, 1913. No. 41223 A.

Engine Balancing

The Balancing of a Polycylindrical Engine on Shipboard (Sull' equilibration di una motrice policilindrica a bordo). Pericle Ferretti. Especially considering the difficulties, due to vibration, etc., in the mounting of a six-cylinder Diesel engine. Diagrams. 4000 w. Rivista Marittima—July-Aug., 1913. No. 45362 E + F.

Engine Log

The Cummings Engine Log System and Revolution Counters. H. R. Gary. Illustrated description of the system installed on the U. S. S. *Arkansas*. 2500 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45168 H.

Engines

Development in Marine Engines. A. Scott Younger. Abstract of paper read before the Sci. Soc. of the Roy. Tech. College, Glasgow. A review of progress since 1880. 5000 w. Mech Engr—Sept. 12, 1913. No. 45294 A.

The Saving of Heat Units in Marine Machinery. Henry C. Dinger. Discusses the possible results of several methods of securing economy which are adaptable to marine work. 7000 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45167 H.

See Diesel Engines, Gas Engines and Oil Engines, under MECHANICAL ENGINEERING, *Combustion Motors*.

Engine Tests

See same heading under MECHANICAL ENGINEERING, *Steam Engineering*.

Experiment Station

The United States Naval Engineering Experiment Station, Annapolis, Md. E. J. King. An account of its origin, establishment, equipment, accomplishment and aims. Ills. 6500 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45170 H.

Ferries

Gasoline Car-Ferry for an Electric Railway. Illustrated description of a car-transfer boat on the Ohio River, at Evansville, Ind. 1500 w. Eng News—Nov. 21, 1912. No. 37730.

Ferryboat

A Sample of Old-Time Engineering Skill. Charles S. Lynch. Illustrated description of the ferryboat "Long Branch," built in 1880 for the East River Ferry

Fuels

Co., N. Y. 1500 w. Int Marine Engng—March, 1913. No. 40289 C.

Steel Screw Ferry-Boat Edward T. Jeffery. J. B. Shipley. Illustrated description of a new ferry-boat for the Western Pacific R. R. Co. 2200 w. Int Marine Engng—Oct., 1913. No. 45657 C. See also Train Ferries, under MARINE AND NAVAL ENGINEERING.

Fireboats

Fireboat David Campbell. Profile with description and trial trip of a fire fighting vessel for the port of Portland, Ore. 1000 w. Marine Rev—July, 1913. No. 43695 C.

Fire Boats of American Cities. William E. Patterson. Illustrated descriptions of boats in use at San Francisco, Duluth, New York, Boston and Seattle. 4500 w. Munic Jour—Aug. 28, 1913. No. 44797.

Fire Extinction

The Use of Gases on Ships for Fire Extinction and Fumigation. E. Kilburn Scott. Read before the Inst. of Marine Engrs. Discusses the problem of fire extinction on shipboard, illustrating and describing various systems. Also fumigation. Ills. 11000 w. Marine Engr, Lond—Dec., 1912. No. 38140 A.

Fire Extinguishers

Fire Extinguishers for Ships' Use. Henry Williams. A discussion of fire extinguishing and forms of apparatus used, and the limitations. Ills. 5000 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40857 H.

Fishing Steamer

A Menhaden Fishing Steamer. George A. Dean, Jr. Illustrated description of the *Joseph F. Bellows* and its equipment. 1200 w. Int Marine Engng—March, 1913. No. 40290 C.

Fog-Signalling

The Mersey Bar Lightship Alarm. Especially describes the illuminating apparatus and fog-signalling apparatus. Ills. 1200 w. Engr, Lond—July 18, 1913. No. 43977 A.

Freighter

Bulk Freighter Keybell. Illustrated description of a vessel built in Canada. 2000 w. Marine Rev—Nov., 1912. No. 37577 C.

Fuels

Use of Fuels in the United States Navy. H. I. Cone. Discusses characteristics required, the advantages of oil as compared with coal, and its probable rapid replacement of coal as a naval fuel. 1500 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38301 H.

Petroleum as a Source of Power for Ships. Dr. Albert Sommer. Remarks on

Consult Classification of the Index. See page 9.

Gasoline Engines

the present wasteful use of coal, and the probable developments, giving data concerning naval advantages obtainable by the use of Diesel engines, the supplies of liquid fuel in America; the heating values, etc. 9000 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38302 H.

Gasoline Engines

The Development of Gas-Power Motors on Water and Their Application to Fishing Boats (Die Entwicklung der Verbrennungskraftmaschine auf dem Wasser und ihre Verwendung in der Fischerei). C. Stein. Types of gas-engines adapted to heavy motor-boats. Ills. Serial. 1st part. 2700 w. Zeit d Mitt Motortwagen Ver—Sept. 30, 1912. No. 37456 D.

See also Ferries, under MARINE AND NAVAL ENGINEERING.

Geared Turbines

Geared Turbines. J. Inglis. Read before the Inst. of Nav. Archts. On the trials of three ferry steamers propelled by geared turbines. 1000 w. Engng—July 4, 1913. No. 43720 A.

Trials of Three Ferry Steamers Propelled by Geared Turbines. J. Inglis. Read before the Inst. of Nav. Archts. Reports trials of the "Curzon," "Elgin," and "Hardinge," vessels intended to connect Ceylon with the mainland of India by a short sea passage. 1200 w. Mech Engr—June 27, 1913. No. 43637 A.

The Isle of Man Geared-Turbine Steamer "King Orry." Drawings and illustrated description with information concerning the Birkenhead works, when it was designed and built. Plate. 2000 w. Engng—June 27, 1913. No. 43641 A.

German Navy

The Growth of a Great Navy. Percival A. Hislam. Reviews the advance of Germany to the second position. Illustrates the latest battle-cruiser, *Goeben*, and the latest German dreadnaught, *Kaiser*. 1800 w. Sci Am—March 15, 1913. No. 40447.

Great Lakes

Coal Shipping on the Great Lakes. J. W. Chamberlin. First of a series of articles discussing all phases of the lake trade. Ills. 2000 w. Coal Age—Aug. 9, 1913. Serial, 1st part. No. 44234.

Guns

Big Naval Guns. A discussion of the recently increased resistance of modern armor, and ways of augmenting the striking power of guns on large battleships. 4500 w. Engr, Lond—Sept. 26, 1913. No. 45742 A.

Gyro-Compass

The Sperry Gyro-Compass in Service. R. E. Gillmor. Explains the difficult

Launching

problems that had to be solved in perfecting this instrument, giving an illustrated detailed description and results of tests. 5400 w. Soc of Nav Archts & Marine Engrs, No. 14—Nov. 21, 1912. No. 37697 N.

Hydrography

The Application of the Modern Principles of Nautical Astronomy to Hydrography (Sull' applicazione dei moderni principi dell' astronomia nautica all'idrografia). R. Carisio. Methods for determining latitude, time, longitude and azimuth. 4400 w. Rivista Marittima—July-Aug., 1913. No. 45361 E + F.

Ice Detection

The Rise of Temperature Associated with the Melting of Icebergs. H. T. Barnes. Gives results of an experimental study. 1000 w. Can Engr—Dec. 19, 1912. No. 38381.

Taking the Temperature of the Sea. Illustrated account of "detector" inventions and investigations for determining the presence of icebergs. 1700 w. Engr, Lond—Aug. 22, 1913. No. 44927 A.

"Imperator"

The Hamburg Amerika Liner "Imperator." Illustrated detailed description. Plates. 5000 w. Engng—June 20, 1913. No. 43386 A.

Power Aboard the "Imperator." Brief illustrated description of the turbine plant, working on the triple-compound system under an initial pressure of 235 lbs. per sq. in. 1000 w. Power—July 8, 1913. No. 43491.

The Fast Turbine Liner "Imperator" (Der Turbinenschnelldampfer "Imperator"). Illustrated description of this new large addition to the Hamburg-America fleet. 1500 w. Schiffbau—June 25, 1913. No. 43516 D.

The Fast Turbine Steamer "Imperator" (Der Turbinenschnelldampfer "Imperator"). Brief description with numerous illustrations. 1100 w. Zeit des Ver deutscher Ing—June 21, 1913. No. 43531 D.

The Quadruple-screw Atlantic Liner "Imperator." Illustrated description and comparison with the "Olympic" and the nearly completed "Aquitania." 1500 w. Shipbldr—Aug., 1913. No. 45307 C.

Lake Steamers

The Largest Paddle-Wheel Steamers on the American Lakes. Describes the *City of Detroit III* and the *See and Bee*. Ills. 2000 w. Engr, Lond—March 7, 1913. No. 40712 A.

Launching

The Launching of the New York. Robert Stocker and Henry Williams. Explains the forces acting on a ship during

Consult Classification of the Index. See page 9.

Launching Devices

launching and discusses difficulties and methods of overcoming them, with details in connection with the vessel named. Ills. 6000 w. Pro U S Nav Inst—Dec., 1912. No. 38641 E.

Holding Devices for Ships on the Stays (Haltevorrichtungen für Schiffe auf der Helling). C. Rath. Describing hydraulic and mechanical releasing triggers. Ills. 4000 w. Schiffbau—Nov. 27, 1912. No. 38437 D.

Launching Ships. A. Hiley. Read before the Inst. of Nav. Archts. Considers a new method of ascertaining the most suitable arrangements. Discusses the launching devices and their influence upon poppet and way-end pressures. 3500 w. Engng—June 6, 1913. Serial. 1st part. No. 42888 A.

A New Method of Stopping a Vessel After Launching. A. Hiley. A friction brake for restricted ways, equal to 80 tons of chain drags. Ills. 1200 w. Shipbldr—Sept., 1913. No. 45311 C.

Launching Devices

Novel Devices Used in the Launching of the Battleship "New York." Illustrates and describes the releasing trigger, the sand blocks and tumbling shores, and the fore poppet cradle. 1000 w. Eng News—Nov. 14, 1912. No. 37589.

Lifeboats

Ships' Lifeboats, Their Stowage and Manipulation. Axel Welin. Deals with the boathage question from a practical point of view. Ills. 6000 w. Trans Inst of Engrs & Shipbldr in Scotland—Jan. 21, 1913. No. 40853 N.

The New English Lifeboat Rules (Das neue englische Gesetz über die Rettungsboote). Discussion by Herr Flamm, and reprint of the Board of Trade rules. 8800 w. Schiffbau—Feb. 26, 1913. No. 40552 D.

Life-saving at Sea. Axel Welin. Illustrated discussion of types of lifeboats, and appliances for lowering them; also the arrangements for carrying the required number. General discussion. 6000 w. Jour Soc of Arts—May 9, 1913. No. 42260 A.

Power Lifeboats—The Lundin Docked Type. General discussion of the requirements of lifeboats, with plans and description of the type named. 3000 w. Int Marine Engng—June, 1913. No. 42602 C.

Cabin-Boats and Davits for Saving Life at Sea. Illustrates and describes arrangements for stowing boats and appliances for handling them. 2500 w. Engng—July 11, 1913. No. 43901 A.

Boats and Davits. Reviews the final report of the Committee on boats and

Marine Engineering

davits. 1600 w. Engr, Lond—June 27, 1913. No. 43647 A.

The Capacity and Stability of Ships' Lifeboats and Rafts. A part of the recent report of the Boats and Davits Committee, discussing open boats. Ills. 2000 w. Shipbldr—Aug., 1913. No. 45306 C.

Lifeboats for Ocean Vessels (Rettungsboote für Seeschiffe). Franz V. Meyer. Outlines present tendencies toward stowage and handling on lately-built steamers, and describes several types of collapsible boats. Ills. 3200 w. Schiffbau—July 23, 1913. No. 44633 D.

See Davits, under MARINE AND NAVAL ENGINEERING.

Life Saving

Notes on Life-Saving Appliances. W. V. Forbes. Discusses principally lifeboats and methods of handling them. Ills. 4000 w. Soc of Nav Archts & Marine Engrs, No. 5—Nov. 21, 1912. No. 37688 N.

Lighthouses

Lighthouses and Buys of New York Harbor. James Pattison. Illustrates and describes lighthouses illuminated by electricity or oil vapor; beacons; combined lighted acetylene and warning buoys; combined lighted Pintsch gas and warning buoys, etc. 2500 w. Int Marine Engng—Jan., 1913. No. 38811 C.

Erection of a Reinforced Concrete Light House Tower at the Entrance of the harbor of Alexandria (Errichtung eines "Leuchtturmes" in Eisenbeton am Eingange der grossen Hafeneinfahrt von Alexandrien). W. Stross. Built in sections on land and towed in final position. Ills. 1800 w. Beton u Eisen—Sept. 13, 1913. No. 46028 E.

Lightship

Motor Lightship "Bürgermeister O'Swald." J. Rendell Wilson. Illustrated description of an interesting vessel stationed in the North Sea at the mouth of the river Elbe. 900 w. Int Marine Engng—April, 1913. No. 40968.

Elbe Estuary Motor Lightship. Illustrated description of the lightship "Bürgermeister O'Swald" and the interesting application of Diesel machinery. 1200 w. Marine Engr & War Craft—Aug., 1913. No. 44309 A.

Marine Boilers

The Arranging of Marine Boiler Mountings. Hints on how to arrange the mountings. 2500 w. Mech Wld—Nov. 1, 1912. No. 37395 A.

Upkeep of Marine Boilers. Charles S. Linch. Suggestions for their care and management. 2000 w. Boiler Maker—Nov., 1912. No. 37350.

Marine Engineering

Some Reminiscences of Early Marine

Consult Classification of the Index. See page 9.

Marine Engines

Engineering. Sir Alexander B. W. Kennedy. 2500 w. Engng—Feb. 14, 1913. No. 40129 A.

Marine Steam Engineering. Theodore Lucas. This second of a series of articles discusses the case of the water-tube boiler. 4000 w. Marine Rev—Feb., 1913. No. 39850.

Marine Engines

Quadruple-Expansion Engines for the T. S.S. "Macedonia." Drawings and description of engines on a vessel in service between Greece and New York. 400 w. Engng—Jan. 10, 1913. No. 39262 A.

See also Diesel Engines, and Steam Turbines, under MARINE AND NAVAL ENGINEERING.

Marine Paints

See Paints, under CIVIL ENGINEERING, *Materials of Construction*.

Masts

Bending Strain of Mast Fittings (Biegungsbeanspruchung von Mastbeschlägen). J. Stieghorst. Mathematical discussion on the stresses in masts, yards, booms, etc. Ills. 3600 w. Schiffbau—Aug. 13, 1913. No. 44635 D.

Merchantmen

Proportion of Merchantmen of German Origin in the Markets of the World (Verteilung der Handelschiffe deutschen Ursprungs auf dem Weltmarkt). Julius Ott. A series of diagrams showing the number of German trading vessels since 1850 as compared with other countries. 2000 w. Schiffbau—June 25, 1913. No. 43517 D.

Model Tank

Model Experimental Tank. Day Allen Willey. Illustrated description of methods of studying currents and suction and how to improve the lines of ships, as carried out at the Washington tank. 3500 w. Marine Rev—Oct., 1913. No. 45677 C.

Motor Boats

Shallow Draft Motor Boats for Commercial Purposes. Illustrates and describes types. 1800 w. Int Marine Engng—Nov., 1912. No. 37172 C.

Prize Contest by the A. D. A. C. for a 2000-Mark Boat (Das Preisausschreiten des A. D. A. C. für ein 2000 Mark Boat). Some of the designs submitted at the contest. 1400 w. Auto Rund—Jan. 15, 1913. No. 40050 D.

Motor Ships

The Motor Ship "Eavestone." Illustrated detailed description of this single-screw motor ship and its Diesel engine. Plates. 5000 w. Engr, Lond—Oct. 25, 1912. No. 37293 A.

First Long Voyage of Motor Ship

Motor Ships

"Eavestone." Report of the performance of the vessel on a trip across the Atlantic, and other information. Ills. 2000 w. Int Marine Engng—Feb., 1913. No. 39657 C.

The Motor Ship Juno. The present number illustrates and describes the engines of the Juno, and matters relating to the design. 5000 w. Plate. Engr, Lond—Nov. 15, 1912. Serial. 1st part. No. 37829 A.

The Sulzer Machinery on the Diesel-Engined "Monte Penedo" (Die Sulzer-Maschinen des Dieselschiffes "Monte Penedo"). Description of machinery. Ills. 2400 w. Zeit d Oest Ing u Arch Ver—Oct. 4, 1912. No. 37436 D.

The Two-Cycle Sulzer-Diesel Engine for the Freighter "Monte Penedo" (Les Moteurs Sulzer-Diesel a Deux Temps du Cargo "Monte Penedo"). Ch. Dantin. Description and operation of engine. Ills. and Plate. 3200 w. Genie Civil—Oct. 26, 1912. No. 37518 D.

The Motor Ship "Monte Penedo." Gives particulars as to the working of the engines. 1000 w. Engr, Lond—Sept. 12, 1913. No. 45404 A.

Motor Ship Rolandseck. Illustrates and describes the Diesel motors, of the Carls-Tecklenborg type, and features of interest. 3000 w. Engr, Lond—Nov. 22, 1912. No. 38035 A.

Motor Ship Rolandseck. Drawings of the Carls-Tecklenborg engines and of the vessel with description of arrangements. Plate. 700 w. Engr, Lond—Dec. 13, 1912. No. 38533 A.

The Motor Ship Rolandseck. Reviews a report made by the chief engineer of the Hausa Line motor ship "Rolandseck," giving particulars of the Diesel engines. 2000 w. Engr, Lond—Aug. 22, 1913. No. 44926 A.

The Diesel-Engined Ship "Rolandseck" (Das Dieselschiff "Rolandseck"). W. Kaemmerer. Description and dimensions of ships, with notes on its behavior when launched. Nov., 1912. Ills. 1700 w. Zeitschr d Ver deutscher Ing—Jan. 4, 1913. No. 40034 D.

Single-Screw Motor Ship of 1500 B. H. P. J. Rendell Wilson. Illustrated description of the motor-ship *Rolandseck*, equipped with Fecklenborg-Carls Diesel engine. 1500 w. Int Marine Engng—March, 1913. No. 40291 C.

The Emanuel Nobel. Illustrated description of this motor ship—the second ship to be fitted with the new design of Werkspoor motors. 1000 w. Engr, Lond—March 28, 1913. No. 41145 A.

The Diesel Oil Tank Ship Hagen. Plans and illustrated description of a recently launched vessel. 700 w. Engr,

Motor Ships

London—March 21, 1913. No. 41021 A.

The Diesel-Engined "Hagen" (Le pétrolier à moteurs Diesel "Hagen"). Dimensions of ship and characteristic features of the engines used. Ills. 3000 w. *Genie Civil*—April 12, 1913. No. 41529 D.

The Tank Ship "Hagen," Built at the Fried. Krupp Co. Germania Docks (Das Tankschiff "Hagen," erbaut von Fried. Krupp A.-G. Germaniaewerft). Plans and general description of vessel and Diesel engines. Ills. 2700 w. *Zeit des Ver deutscher Ing*—April 5, 1913. No. 41468 D.

The Motor Tank Ship "Hagen," Built at the Fried. Krupp Germania Docks (Das Motor-Tankschiff "Hagen," erbaut von der Fried. Krupp A.-G. Germaniaewerft). Details of this new Diesel-engined tank ship. Ills. Six plates. Serial. 1st part. 3200 w. *Schiffbau*—March 12, 1913. No. 41434 D.

German Diesel Engined Tank Ship Hagen. Illustrated detailed description of this oil-engined vessel. 3500 w. *Int Marine Engng*—May, 1913. No. 41898 C.

Twin-Screw Motor Ship "Hagen." A New Krupp Two-Stroke Type Diesel Engine Tank Vessel of 2400 B Hp. J. Rendell Wilson. Brief illustrated description of the engines. 1800 w. *Eng News*—May 1, 1913. No. 41865.

Internal-Combustion Engines for Ocean-going Ships. This fifth article on this series describes and illustrates profusely the machine parts of the German tank-ship "Hagen." 2000 w. *Shipbldr*—May, 1913. No. 42507 A.

The Oil-Engined Ship "Fordonian." Drawings and description of the ship and machinery. A ship of the cargo-boat type, with a single screw, propelled by two-stroke cycle Diesel oil engines. Plate. 8500 w. *Engng*—Dec. 13, 1912. No. 38521 A.

Motor-Driven Ship Fordonian. Drawings and description of a Diesel-engined vessel for service on the Great Lakes. 3500 w. *Marine Rev*—July, 1913. No. 43694 C.

Performance on Service of the Motor Ship "Suecia." I. Knudsen. Read before the Inst. of Nav. Archts. Describes vessel of the Sweden-La Plata service, chiefly employed for cargo purposes, and working of the Diesel engines. 1200 w. *Mech Engr*—June 27, 1913. No. 43638 A.

The Motor Ship Christian X. Report on the performance of this vessel. 1800 w. *Engr*, Lond—July 18, 1913. No. 43974 A.

Motor Ship Isleford. Plans and description of the largest semi-Diesel en-

Oil Engines

gine afloat, and results of her trial. 1500 w. *Marine Rev*—Aug., 1913. No. 44284 C.

The Electric Motor Ship Tynemouth. Illustrated description of this vessel for service on the Great-Lakes and canals, and of its machinery. 2000 w. *Engr*, Lond—Oct. 10, 1913. No. 45987 A.

See also Tugboats and Propulsion, under MARINE AND NAVAL ENGINEERING.

Naval Architecture

The German Naval Architects. A review of papers and discussions at the recent meeting in Charlottenburg. 5000 w. *Engr*, Lond—Nov. 29, 1912. Serial. 1st part. No. 38134 A.

Naval Engineering

Presidential Address. Sir Charles Algernon Parsons. Reviews the progress of marine engineering, its present condition, and related topics. 8500 w. *Trans N-E Coast Inst of Engrs & Shipbldr*—Nov., 1912. No. 38673 N.

Navigation

A Problem in Coastwise Navigation. (Un problema di navigazione costiera). A. Jachino. The effects of local magnetic disturbances and problems arising therefrom. Ills. 6000 w. *Rivista Marittima*—Sept. 30, 1912. No. 37524 E + F.

The Determination of a Ship's Position at Sea by Wireless. J. Erskine Murray. A simple means of obtaining knowledge in foggy weather. 1500 w. *Trans Inst of Engrs & Shipbldr* in Scotland—Nov. 19, 1912. No. 39553 N.

Why Not Channel Trolleys? Describes a plan for doing away with pilots and lessening fog dangers. Ills. 1200 w. *Cassier's*—June, 1913. No. 42869 B.

Navy Yards

Navy Yards as Manufacturing Establishments, and the Cost of Manufactured Articles. C. A. Harrington. Information and discussion of methods of reducing costs and securing efficiency. 2000 w. *Pro U S Nav Inst*—Dec., 1912. No. 38640 E.

The Transportation System of a Navy Yard. R. E. Bakenhus. States the general principles affecting a transportation system, suggesting possible improvements. 2500 w. *Pro U S Nav Inst*—Sept., 1913. No. 45422 E.

Oil Engines

Developments in Oil Burning. E. H. Peabody. Discusses some of the main characteristics of the mechanical atomizer and modern methods of handling it, reporting experiments and results. Ills. 7800 w. *Soc of Nav Archts & Marine Engrs*, No. 6—Nov. 21, 1912. No. 37689 N.

Consult Classification of the Index. See page 9.

Oil Fuel

Marine Oil Engines (Motore ad olio pesante tipo marino). Enrico Mariotti. General features of marine oil engines. Ills. 2300 w. Ingeg Ferroviaria—Oct. 15, 1912. No. 37529 E.

The Possibilities of the Marine Oil Engine. Theodore Lucas. A study of the advantages and disadvantages. Ills. 4000 w. Int Marine Engng—Feb., 1913. No. 39654 C.

The "Kromhout" Heavy Oil Engine with Incandescent Combustion Chamber (Moteur à huile lourde "Kromhout" à chambre de combustion incandescente). O. H. Wildt. Description of 52-h.p., two-cylinder marine engine, and 5-h.p., single-cylinder stationary engine. Ill. and plate. 4000 w. Genie Civil—Feb. 1, 1913. No. 40070 D.

An Oscillating Marine Motor. Illustrates and describes a two-cycle oscillating engine invented by C. A. Williamson. 1000 w. Engr, Lond—Feb. 21, 1913. No. 40318 A.

23-Horsepower Djinn Petroleum Marine Motor. Illustrated description of a two-cylinder marine oil-engine of English manufacture. 800 w. Engng—March 7, 1913. No. 40708 A.

20 Horse-Power Marine Oil Engine. Illustrated description of an engine of the "semi-Diesel" type, for a sea-going pleasure cruiser. 1200 w. Engr, Lond—June 20, 1913. No. 43395 A.

See also Diesel Engines and Motor Ships, under MARINE AND NAVAL ENGINEERING, and same heading and Combustion Motors, under MECHANICAL ENGINEERING.

Oil Fuel

Oil Fuel for Marine Engines and Boilers. C. Zulver. Read before the Inst. of Marine Engrs. Gives facts in regard to results obtained from the use of oil fuel on board ship. Ills. 7000 w. Marine Engr & Nav Archt—March, 1913. No. 40459 A.

The History of the Development of Fuel Oil Firing on Ships (Beitrag zur Geschichte der Entwicklung der Feuerung mit flüssigen Brennstoffen auf Schiffen). Dr. Praetorius. Outline of the production of oil and its use on steamships. Serial. 1st part. 6000 w. Schiffbau—March 12, 1913. No. 41436 D.

Oil Fuel in the Royal Navy. Reviews briefly the history of the adoption of oil and discusses use, supply, &c. 2500 w. Engr, Lond—July 25, 1913. No. 44187 A.

The Wallsend-Howden System of Oil Burning in Marine Boilers. Plate and description of the general arrangement for the storage, treatment, and passage

of oil to the burners. 700 w. Engng—July 25, 1913. No. 44185 A.

Olympic

The Reconstruction of the "Olympic." Brief account of the changes introduced. The construction of an inner skin up to a point above the water line, and increase in bulkheads, with other changes. 600 w. Engr, Lond—March 28, 1913. No. 41146 A.

Pacific

Policing the Pacific. Henry Harrison Suplee. Calls attention to the responsibility of the United States for peace on the Pacific and lands bordering it, and discussing how war may be avoided. Ills. 3500 w. Cassier's—July, 1913. No. 43347.

Periscope

The Goerz Panoramic Periscope for Submarines (Le Périscope panoramique Goerz, pour sous-marins). Describes the arrangement and general details of this instrument. Ills. 2400 w. Genie Civil—Aug. 9, 1913. No. 45347 D.

Plate

The Solidity of Taut Rectangular Plate and Its Riveted Margin (Zur Festigkeitsberechnung der eingespannten Rechteckplatte und deren Randträger). E. Kammer. Mathematical calculations on the strains induced, especially in the skins of ships. Diagrams. Serial, 1st part. 3200 w. Schiffbau—Jan. 8, 1913. No. 40019 D.

Port Machinery

Port Facilities for Ships and Cargoes in the United States. William T. Donnelly. Abstract of paper and discussion. Discusses facilities for loading and unloading cargoes, the different conditions of European and American ports, and especially the difficulties at New York. 4500 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42958 D.

Propeller Design

Operation and Calculation of Ship Propellers (Die Wirkungsweise und Berechnung von Schiffsschrauben). Dr. Rothe. Studies of stream flow from the blades and stream action on them. Ills. Serial, 1st part. 3500 w. Die Turbine—Jan. 20, 1913. No. 40053 D.

Propellers

Screw Propellers. Alfred J. C. Robertson. The deduction of simple mathematical formulae for designing highly efficient propellers for any requirements. Diagram. 1400 w. Shipbldr—Sept., 1913. No. 45309 C.

Design of Propellers for Geared Turbines. Peter Doig. Gives chart and explanation of its use in designing geared turbine propellers. 1800 w. Int Marine Engng—Oct., 1913. No. 45659 C.

Propeller Experiments. Ole G. Halvor-

Consult Classification of the Index. See page 9.

Propellers

Propeller Shafts

sen. A report of experiments and description of propeller designs and results obtained. Ills. 2000 w. Engr, Lond—Sept. 26, 1913. No. 45743 A.

Screw Propellers. C. W. Dyson. Discusses methods of design, design by comparison; effect of thrust deduction and reduction of diameter on the propulsive coefficient. 17000 w. Jour Am Soc of Nav Engrs—May, 1913. No. 42918 H.

Empirical Method of Screw Propeller Design. Peter Doig. Considers methods in vogue. 2000 w. Int Marine Engng—June, 1913. Serial. 1st part. No. 42601 C.

See same heading, under **MECHANICAL ENGINEERING, Aeronautics, and Molding, under MECHANICAL ENGINEERING, Machine Works and Foundries.**

Propeller Shafts

Investigations on the Influence of Axial Loading on the Modulus of Torsion (Untersuchung über den Einfluss einer Axialbelastung auf den Gleitmodul bei Drehung). Paul Nettmann. Experiments on torsion of shafts, especially propeller shafts. Ills. Serial. 1st part. 6000 w. Die Turbine—Oct. 5, 1912. No. 37459 D.

Propulsion

On the Standardization of Warship Propelling Machinery. Leonardo Fea. Trans. from the Italian. Reviews the types of boilers used by different countries on their warships. Also engine standardization. 2500 w. Engng—Jan. 10, 1913. No. 39264 A.

Mechanical Gearing for the Propulsion of Ships. Sir Charles A. Parsons. Read before the Inst. of Nav. Archts. An account of the progress made up to the present time. Ills. 2500 w. Engng—March 14, 1913. No. 40827 A.

Propelling Machinery of U. S. Battleships. Ernest H. B. Anderson. A reply to criticisms against the adoption of turbine-propelling machinery in battleships and arguments favoring the retention of the Parsons reaction type of rotative engine. 3300 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40860 H.

Modern Ship Propulsion. Carl C. Thomas. An outline of the present situation regarding the use of steam engines, turbines and internal combustion engines on shipboard. Ills. 2500 w. Wis Engr—May, 1913. No. 42443 C.

Ship Resistance and Ship Propellers (Scheepsweerstand en Scheepsschroeven). C. H. Holst. Studies on the theoretical and practical resistance factors, together with propeller design. Ills. 5100 w. De Ingenieur—April 12, 1913. No. 42162 D.

Electric Propulsion. John Reid and H.

Resistance

A. Mavor. Describes the "Tynemount," and shows how electricity solves certain difficulties in the power question. Ills. 5000 w. Marine Engr—July, 1913. No. 43704 A.

The Electrical Propulsion of Ships. W. L. R. Emmet. Shows how recent developments of the turbine has made possible electric propulsion, and explains the method proposed. Ills. 3000 w. Jour Fr Inst—July, 1913. No. 44029 D.

Transmission Apparatus for the Propulsion of Ships and Other Purposes (Les appareils de transmission pour la propulsion des navires et pour diverses applications à bord). C. N. A review of purely mechanical, electrical, and hydraulic power transmission on shipboard. Ills. 4500 w. Tech Mod—July 15, 1913. No. 43583 D.

A New Towage Test for the Investigation of Model Propellers in Conjunction with the Ship's Model (Eine neue Schleppversuchsmethode zur Untersuchung von Modellpropellern in Verbindung mit dem Schiffsmodell). Franz Matthias. An improvement upon the Froude method, by which both propeller and vessel may be tested simultaneously. Ills. 2000 w. Schiffbau—July 9, 1913. No. 44631 D.

Reinforced Concrete

A Boat of Reinforced Concrete (Boot aus Eisenbeton). Hermann Roch. Briefly illustrated description of a small sailboat, entirely built of this material, watertight and seaworthy. 400 w. Beton u Eisen—Jan. 3, 1913. No. 40030 E.

Resistance

The Progress of a Ship in Confined Waters (Fahrt der Schiffe auf beschränktem Wasser). H. Krey. Experiments to determine the resistance caused by back action in narrow channels. Ills. Serial. 1st part. 4400 w. Schiffbau—March 26, 1913. No. 41438 D.

The Energy Systems Accompanying the Motion of Bodies Through Air and Water. J. B. Henderson. Read before the Inst. of Nav. Archts. Calls attention to important features prominent in the mathematical treatment but neglected in experimental research. 4000 w. Engng—April 18, 1913. No. 41772 A.

Effect of Form and Size on the Resistance of Ships. G. S. Baker and J. L. Kent. Read before the Inst. of Naval Archts. Deals with the variation of resistance of ships with speed and with fullness of form. 4500 w. Engng—July 25, 1913. No. 44186 A.

Review of 1912

Marine Engineering in 1912. A general review of the work of the year. Ills.

Consult Classification of the Index. See page 9.

Rudders

2500 w. Engr, Lond—Jan. 3, 1913. No. 39163 A.

Shipbuilding and Marine Engineering in 1912. Review of production and statistics for the United Kingdom. 8500 w. Engng—Jan. 3, 1913. No. 39160 A.

Rudders

Rudder Trials, U. S. S. Sterett. R. T. Hanson and J. C. Hunsaker. Describes trials and gives results. Ills. 8000 w. Soc of Nav Archts & Marine Engrs, No. 11—Nov. 21, 1912. No. 37694 N.

The Pendulum Propeller Rudder. H. C. Vogt. Illustrated description of an oscillating substitute for the screw. 4500 w. Sci Am Sup—May 24, 1913. No. 42317.

Safety

Safety of Life at Sea. James Donald. Gives a general outline of what has been done by Great Britain and the United States to secure safety of life at sea, more particularly by life-saving appliances and by watertight subdivision of vessels. Discussion. 9500 w. Jour Fr Inst—Jan., 1913. No. 39355 D.

On Safety of Life at Sea. Percy A. Hillhouse. Read before the Inst. of Nav. Archts. at Glasgow. Discusses causes of accidents, and what has been done to increase the safety. 3000 w. Engng—June 27, 1913. No. 43645 A.

Salvage

The Salvage and Repair of the Steamship "Royal George." R. G. Skerrett. Brief illustrated description of interesting salvage work of a vessel on the St. Lawrence River. 1000 w. Sci Am—July 26, 1913. No. 43862.

Salvage

Salvage the "Lutine." Percival A. Hisslam. An account of the recent work of the National Salvage Assn. of London to secure the treasure sunk with this British frigate in Oct., 1799. Ills. 1500 w. Sci Am—May 17, 1913. No. 42097.

Raising the United States Brig "Niagara." W. L. Morrison and A. G. Kessler. An outline of the battle of Lake Erie, with detailed description of the raising of the "Niagara." 2000 w. Sci Am—June 28, 1913. No. 43199.

The Salvage of the United States Army Transport "Liscum." Illustrated description of methods used in raising this vessel which sank Aug. 25, 1912, in front of the Old Dock, Shanghai. 500 w. Engr, Lond—Sept. 5, 1913. No. 45157 A.

See Submarines and Tugs, under MARINE AND NAVAL ENGINEERING.

Ship Boilers

See Boilers, under MECHANICAL ENGINEERING, Steam Engineering.

Ship Coaling**Shipbuilding**

The Ultimate Dimensions of the Largest Seagoing Vessels. C. E. Grunsky. Reviews papers bearing on the size of vessels, and dimensions of maritime canals, presented at the International Navigation Congress. 6000 w. Jour Assn of Engng Soc—Nov., 1912. No. 37534 C.

Nine Months Clyde Shipbuilding—Past Work and Prospects. A review of the past quarter. 1200 w. Engr, Lond. Oct. 25, 1912. No. 37294 A.

Progress in British Ship Yards (Fort-schritte in den britischen Schiffbau-betriebe) Otto Lienau. Present practice in British shipbuilding, improved designs, etc. Ills. Serial. 1st part. 4000 w. Schiffbau—Oct. 9, 1912. No. 37422 D.

Notes on Inspection Duty at Shipbuilding Works. A. B. Willits. Helpful suggestions for the inexperienced. 9000 w. Pro U S Nav Inst—Dec., 1912. No. 38639 E.

The Fourteenth General Assembly of Shipbuilders, Nov. 22-23, 1912 (Die XIV Hauptversammlung der Schiffbautechnischen Gesellschaft am 22. und 23. November, 1912). Herr Flamm. Brief abstracts of the papers read and their discussions. 7200 w. Serial. 1st part. Schiffbau—Dec. 11, 1912. No. 39009 D.

Technical Growth of the Austrian Merchant Marine (Die technische Entwicklung der österreichischen Handelsmarine). Ernst Grafen Aichelburg. A review of progress in shipbuilding in Austria. Ills. 3000 w. Zeit & Oest Ing u Arch Ver—April 18, 1913. No. 42148 D.

The World's Naval and Merchant Shipbuilding. Information from Lloyd's Register, reporting the shipbuilding during the past year. 3500 w. Engng—Jan. 24, 1913. No. 39797 A.

Shipbuilding Berth Gantries at the Nagasaki Yard. Reviews briefly the progress of shipbuilding in Japan, illustrating and describing the arrangements for handling materials. 1200 w. Engng—Feb. 14, 1913. No. 40131 A.

Shipbuilding Symbols

Concerning International Symbols in Shipbuilding (Ueber eine internationale Sprache im Schiffbau). Dr. Gümbel. Suggested expressions for international usage, for dimensions and formulae. Diagrams. Serial. 1st part. 3200 w. Schiffbau — March 12, 1913. No. 41435 D.

Ship Coaling

Coaling Ships at Sea (See-Bekohlrichtungen für Schiffe). Herr Wintermeyer. Illustrates and describes bucket, crane, transporter, and cableway meth-

Consult Classification of the Index. See page 9.

Ship Construction

ods while ships are anchored or in motion. 4800 w. *Zeitschr des Ver deutscher Ing*—Oct. 5, 1912. No. 37445 D.

Ship Construction

The Watertight Subdivision of Ships. J. Bruhn. Considers the usual causes of injuries to ships which may cause them to founder, discussing the value of the double skin, and of watertight bulkheads and related subjects. 7000 w. *Trans Inst of Engrs & Shipbldrs in Scotland*—Dec. 17, 1912. No. 40401 N.

Ship Construction Treated from a Structural Engineering Standpoint. James E. Steele. Discusses the problem of getting a ridge-like structure which will carry the uniform load due to cargo. 3000 w. *Int Marine Engng*—Sept., 1913. No. 44836 C.

Ship Design

Notes on Fuel Economy as Influenced by Ship Design. E. H. Rigg. Points out possible economies due to efficient ship design. 1800 w. *Soc of Nav Archts & Marine Engrs*, No. 9—Nov. 21, 1912. No. 37692 N.

The Influence of Form on the Economical Running of a Ship. Ernest Saxton White. The discussion is confined to the ordinary type of shelter deck cargo steamer. Gives curves and running costs of several forms of vessel. General discussion. Plates. 6000 w. *Trans N-E Coast Inst of Engrs & Shipbldrs*—Dec., 1912. No. 38674 N.

The Unsinkability of Modern Sea-Going Ships. Prof. Flamm. Investigations of the stability of ships and suggestions of studies necessary in revising rules relating to arrangements for safety, especially those in which the hull is subdivided by bulkheads. Diagrams. 2500 w. *Engng*—Feb. 14, 1913. No. 40128 A.

Some Notes on the Arch Principle of Ship Construction. Maxwell Ballard. Describes the structural arrangements and discusses the technical side of the arch design and commercial considerations, and gives tabulated comparisons. Plates. 6000 w. *Trans. N-E Coast Inst of Engrs & Shipbldrs*—Jan., 1913. No. 39999 N.

Influence of Chief Dimensions and Bottom Lines on the Actual Speed of Ships (Influence des dimensions principales et des formes des carènes sur les vitesses réalisées par les navires). L. Le Besnèrais. A study of the resistances. Ills. Serial, 1st part. 5400 w. *Tech Mod*—Feb. 15, 1913. No. 40068 D.

The "Titanic" Disaster, and Watertight Compartments of Large Mail Ships (Het ongeval van de "Titanic" en de waterdichte indeeling van groote mail-

Stability

booten). E. Vossnack. Detailed studies on the design of large ships. Ills. and plates. 15600 w. *De Ingenieur*—March 29, 1913. No. 41505 D.

See also Corrugated Ship, under MARINE AND NAVAL ENGINEERING.

Ship Forms

Methodical Experiments with Mercantile Ship Forms. G. S. Baker. Read before the Inst of Nav. Archts. Gives results of research work carried out at the William Froude Tank. Ills. 4000 w. *Engng*—April 11, 1913. No. 41394 A.

Methodical Experiments with Mercantile Ship Forms. G. S. Baker. Read before the Inst. of Naval Archts. Results of research work at the William Froude tank, with description of the methods used to secure accuracy. 3500 w. *Engr*, Lond—May 23, 1913. No. 42759 A.

Ship Model

The Tetrahedron Ship Model. An examination of tetrahedron forms, their speed, stability, strength, etc. 1600 w. *Engr*, Lond—July 18, 1913. No. 43976 A.

Ship Speed

Logarithmic Speed-Power Diagrams. Thomas M. Gunn. Explains a means of convenient application of the laws of comparison for ships and propellers. Diagrams. 2500 w. *Soc of Nav Archts & Marine Engrs*, No. 12—Nov. 21, 1912. No. 37695 N.

Ship Stability

A Stability Indicator (Ein Stabilitäts-indikator). Dr. Kempf. A new device, graphically indicating the roll of the ship. Ills. 1600 w. *Schiffbau*—Jan. 8, 1913. No. 40020 D.

Ship Ventilating

See Fans, under MECHANICAL ENGINEERING, Heating and Cooling.

Soundings

Swedish Signal-Sounding Apparatus for Locating Shoals and Submarine Mines (Sonde a signal et appareil Svedois pour decouvrir les bas-fonds et les mines sous-marines). Emile Smith. An underwater towing device which interrupts connection upon hitting obstructions. Ills. 1500 w. *Genie Civil*—May 17, 1913. No. 43082 D.

Stability

Active Type of Stabilizing Gyro. Elmer A. Sperry. Considers the advantages to be derived by efficiently stabilizing ships, and the methods employed. Ills. 6000 w. *Soc of Nav Archts & Marine Engrs*, No. 10—Nov. 21, 1912. No. 37693 N.

A Gyroscopic Mechanism for Recording Roll and Pitch of Vessels at Sea. Brief illustrated description of an ingenious device invented by Elmer A.

Stabilizer

Sperry. 1000 w. Sci Am—Aug. 23, 1913. No. 44500.

Stability of Ships—Notes for Commanders. George Nicol. Discusses the importance of training those responsible for the loading of ships in knowledge of the stability of floating vessels. Ills. 2500 w. Int Marine Engng—Jan., 1913. No. 38813 C.

The Calculations of Stability of Ships in Non-Intact Conditions. W. S. Abell. Read before the Inst. of Nav. Archts. Suggests improvements in calculations of stability of damaged vessels. 2800 w. Engng—March 21, 1913. No. 41019 A.

Notes on Initial Stability. A. Cannon. A study on applied mathematics. 2200 w. Trans Inst. of Engrs & Shipbldrs in Scotland—March 18, 1913. No. 42330 N.

Some Further Notes on Approximate Stability. Arthur R. Liddell. Discusses problems of a ship's stability. 1000 w. Engng, Lond—April 25, 1913. No. 41932 A.

Effect of Internal Loose Water on the Rolling of Ships. A. Cannon. Read before the Inst. of Naval Archts. Explains the events that led to the experimental work described. Ills. 6000 w. Engng—July 18, 1913. No. 43970 A.

The Effect of Water-Chambers on the Rolling of Ships. Lloyd Woollard. Read before the Inst. of Naval Archts. An investigation of the efficiency of water-tanks as a means of reducing rolling at sea. 2500 w. Engng—July 11, 1913. No. 43903 A.

Notes on the Stability of Leaky Ships (Beitrag zur Stabilität des lecken Schiffes). Erich Koch. Supplementary contribution to the previous calculations of Dr. Flamm. 2600 w. Schiffbau—June 25, 1913. No. 43518 D.

See also Gyroscopes, under MECHANICAL ENGINEERING, *Machine Elements and Design*.

Stabilizer

Frahm Anti-Rolling Tanks. Review of paper by Major Pecoraro in *Rivista Marina*. Gives diagrams illustrating the effect of anti-rolling tanks and discussion of this invention. 1500 w. Engr, Lond—March 14, 1913. No. 40832 A.

The Elimination of Rolling (Le casse di rollio). Nino Pecoraro. A review of the stabilizer experiments of Schlick, Sperry, Cremieu and Frahm. Ills. 1400 w. Rivista Marina—Feb., 1913. No. 40622 E + F.

Steam Engineering

Marine Steam Engineering. Theodore Lucas. Discusses recent developments of steam engineering practice and its fu-

Steamships

ture outlook. 3500 w. Marine Rev—Nov., 1912. No. 37579 C.

Steamships

The First of the Eight New American-Hawaiian Steamers. Plans and description. 1500 w. Int Marine Engng—Nov., 1912. No. 37174 C.

Shallow Draft, Tunnel Stern Steamer Thousand Islander. Illustrated detailed description of this vessel designed especially for service on the St. Lawrence River. 5000 w. Int Marine Engng—Nov., 1912. No. 37173 C.

The New Buffalo Steamer "See and Bee." Illustrated description of the largest side-wheeler in the world to be used on the Great Lakes. 5000 w. Marine Rev—Nov., 1912. No. 37578 C.

Side-Wheel Passenger Steamer. See and Bee. Illustrated description of a vessel for service between Cleveland and Buffalo. 4000 w. Int Marine Engng—June, 1913. No. 42603 C.

The French Trans-Atlantic Liner "Rochambeau." Illustrated description of this new steamship for service between Havre and New York. Plate. 800 w. Engng—Nov. 22, 1912. Serial. 1st part. No. 38032 A.

Twin-Screw Steamer "Indarra." Illustrated description of a vessel built for the Australian United Steam Navigation Co. 1200 w. Marine Engr, Lond—Dec., 1912. No. 38141 A.

Lengthening the Aberdeen Liners Marathon and Miltiades. Gives particulars of the vessels and describes the work of severing and lengthening. Ills. 1400 w. Engr, Lond—Jan. 17, 1913. No. 39487 A.

The Shallow Draught Steamer Comte de Flandre. Illustrated description of a steamer intended for service on the Congo to carry oil. 600 w. Engr, Lond—Dec. 27, 1912. No. 38905 A.

Great Lakes Steamers for Coastwise Service. Illustrates and describes features of the seven freight steamships built for service in the Atlantic and Pacific coast trade. 1200 w. Int Marine Engng—Feb., 1913. No. 39653 C.

Typical Ships. This first of a series of articles considers the up-to-date cargo ship in modern service. Ills. 2500 w. Engr, Lond—Jan. 24, 1913. Serial, 1st part. No. 39808 A.

The Spanish Quadruple-Screw Liner *Reina Victoria-Eugenia*. Illustrated detailed description of one of the two steamers built for passenger and mail service between Spain and the South American countries. Plate. 2500 w. Engr—March, 1913. Serial. 1st part. No. 40709 A.

Launch of the Latest Giant Steamship.

Consult Classification of the Index. See page 9.

Steamships

Illustrates and describes details of the "Vaterland," 950 feet in length. 1000 w. Sci Am Sup—April 12, 1913. No. 41181.

Quadruple-Screw Turbine Allan Liner "Alsatian." Illustrates and describes this recently launched vessel and its equipment, giving much information of interest. Plate. 6500 w. Engng—April 4, 1913. No. 41240 A.

The Clyde Line Coastwise Steamship "Lenape." Illustrated detailed description of a coast vessel and its equipment. Plate. 3000 w. Int Marine Engng—April, 1913. No. 40967 C.

Geared Turbines in Cargo Steamer "Cairnross." C. Waldie Cairns. Read at N.-E. Coast Inst. of Engrs. & Shipbuilders. Gives results of a comparative trial between the triple-expansion engine and geared turbines in cargo steamers. Editorial. Ills. 8000 w. Engng—April 4, 1913. No. 41241 A.

Geared Turbine Steamers for the South Indian Railway. Illustrates and describes the general arrangement and details of the propelling machinery in the geared turbine steamers, Curzon, Hardinge and Elgin. Plate. 400 w. Engr, Lond—May 2, 1913. No. 42011 A.

Quadruple Screw Turbine-Driven Allan Liner "Calgarian." Illustration and brief description of a recently launched ship, for service between Liverpool and the St. Lawrence. 1200 w. Mech Engr—May 2, 1913. No. 42001 A.

Spanish Transatlantic Liner "Infanta Isabel de Borbon." Illustrated description of the ship and its machinery, with information of interest. 3500 w. Engng May 2, 1913. Serial. 1st part. No. 42006 A.

The French South Atlantic Liner "Lutetia." Illustrated description of the largest steamship running between French ports and South America. 800 w. Engr, Lond—May 9, 1913. No. 42295 A.

The "Aquitania." Illustrations with brief description of the latest addition to the Anglo-American fleet. 700 w. Sci Am Sup—April 26, 1913. No. 41615.

The Cunard Liner "Aquitania." Information concerning this huge vessel, to be launched in April. 1000 w. Engr, Lond—Jan. 31, 1913. No. 39817 A.

The Launch of the "Aquitania." Drawings and illustrated description of the very successful launch of this large vessel. Plate. 1200 w. Engng—April 25, 1913. No. 41930 A.

The new Cunard Liner "Aquitania." Illustrated detailed description of the largest ship yet built for express service to New York. Plates. 12500 w. Engng—April 18, 1913. No. 41766 A.

Steamships

The Cunard Liner "Aquitania." Brief description of leading particulars and illustrations of its construction. 1000 w. Shipbldr—May, 1913. No. 42508 A.

The Geared-Turbine Ferry Steamers "Curzon," "Hardinge" and "Elgin." Leading particulars of three vessels built for the Indo-Ceylon ferry service. Ills. 1500 w. Shipbldr—June, 1913. No. 43058 C.

The Passenger and Cargo Steamer "Digby." Dimensions and construction particulars of this vessel recently constructed for service between Halifax and Liverpool. Plates. 1500 w. Shipbldr—June, 1913. No. 43059 C.

New Pacific Coastwise Steamship Congress. Illustrated description of a vessel for service between Seattle, Wash., and San Diego, Cal. The largest vessel so far built for the sea coasting trade of the United States. 3000 w. Int Marine Engng—July, 1913. No. 43418 C.

Hudson River Steamer Washington Irving. Brief illustrated description of this large side-wheel steamer. 2000 w. Int Marine Engng—July, 1913. No. 43416 C.

The Cunard Canadian Liner "Andania." Illustration and short description of one of a pair of sister ships. 700 w. Engng—Aug. 15, 1913. No. 44726 A.

New Navigation Material on the Rhone (Neues Schifffahrtsmaterial für die Rhone). Rud. Schättli. A brief review of conditions on the Rhone river, and details of the new river boat "France." Ills. 2800 w. Schweiz Bau—Aug. 16, 1913. No. 44643 D.

Old Dominion Line's Freight Steamer "Tyler." Illustrated description of a new vessel to be used exclusively for freight. 800 w. Int Marine Engng—Sept., 1913. No. 44834 C.

The Quadruple-screw Steamers "Empress of Russia" and "Empress of Asia." Dimensions, plans and description of these two steamers for service between Canada and western Pacific ports. Ills. 1200 w. Shipbldr—Sept., 1913. No. 45308 C.

New Pacific Liner Built at Newport News. Describes the new steel single-screw steamship Matsonia, for service between San Francisco and Honolulu. Ills. 2500 w. Int. Marine Engng—Oct., 1913. No. 45658 C.

Steamship Matsonia. Illustrated description of a steel, single-screw steamship for service between San Francisco and Honolulu, Hawaii. 3000 w. Marine Rev—Oct., 1913. No. 45678 C.

Trial Runs of the Pacific Liner Congress. Illustrated description of this

Steam Turbines

twin screw passenger and freight steamer, with report of trials. 1200 w. *Int Marine Engng*—Oct., 1913. No. 45656 C.

Steam Turbines

Geared Turbines. George Westinghouse. From the *Engng. Sup.* of *London Times*. Discusses their development for ship propulsion. 2200 w. *Sci Am Sup*—Dec. 21, 1912. No. 38319.

Marine Turbine Operation and Economy. H. C. Dinger. Gives a set of instructions which have been successfully used. 2500 w. *Int Marine Engng*—Feb., 1913. Serial. 1st part. No. 39656 C.

The Marine Turbine of Franco Tosi in Legnano (Die Schiffsturbine von Franco Tosi in Legnano). Details of some of the important features of the Tosi marine turbine. Ills. 1600 w. *Zeit f d Ges Turbinwesen*—Dec. 30, 1912. No. 39047 D.

The Curtis Turbines of the Scouts "Marsala" and "Nino Bixio." Vittorio Malfatti. Abstract translation from the Italian. A general description of the Curtis turbine and its application to these ships of the Italian Navy. 2000 w. *Engng* Jan. 31, 1913. No. 39806 A.

Submarine Mines

The Elia System of Construction and Placing Submarine Mines (La construction et la pose des mines sous-marines système Elia). General description of this system. Plate. 4000 w. *Genie Civil*—Jan. 4, 1913. No. 39090 D.

Development of the Submarine Mine in the United States Service. Richmond P. Davis. Reviews the history of the development in the United States service, and briefly considers automobile torpedoes in harbor defense. Ills. 4500 w. *Jour U S Art*—Jan.-Feb., 1913. No. 39949 D.

The Ships "Pluton" and "Cerbère" for Anchoring Submarine Mines (Les navires mouilleurs de mines sous-marines "Pluton" et "Cerbère"). M. Gouriet. General description of the construction of ships for this purpose. Ills. 2200 w. *Genie Civil*—April 26, 1913. No. 42193 D.

Submarines

Salvage and Testing Facilities for Submarines. R. G. Skerrett. Illustrates and describes boats and docks in France, Germany, Italy, and under construction in England. 1800 w. *Sci Am*—Nov. 23, 1912. No. 37732.

Military Value and Tactics of Modern Submarines. Discusses the factors of communication, mobility, invulnerability and offensive strength; the relative advantages and disadvantages of submarines and submersibles, etc. Ills. 5000

Tank Steamers

w. *Pro U S Nav Inst*—Dec., 1912. No. 38638 E.

Russia's Submarine Cruiser. R. G. Skerrett. Illustrated description of a submersible of 5400 tons displacement. 900 w. *Sci Am*—April 26, 1913. No. 44593.

Rudiments of the Dynamics of Submarine Propulsion (Grundlagen zu einer Dynamik der Unterwasserfahrt). Marcell Klein. Mathematical discussion of underlying principles. Diagrams. Serial. 1st part. 4800 w. *Schiffbau*—March 12, 1913. No. 41437 D.

The Visibility of Submarines. W. L. Cathcart. Shows how the effectiveness of submarines is crippled by the development of aviation. Aviators can easily see submarines invisible at the surface. 1500 w. *Sci Am*—Aug. 16, 1913. No. 44353.

Submarine Ship Construction (Unterseebootbau). Herr Aarestrup. A review of the several European firms engaged in submarine construction and their output. 2600 w. *Schiffbau*—July 23, 1913. No. 44634 D.

Suction

Experiments on Suction or Interaction Between Passing Vessels. A. H. Gibson and J. Hannay Thompson. Read before the Inst. of Nav. Archts. Describes experiments carried out to obtain information as to the magnitude and range of action of the forces involved. Ills. 4500 w. *Engr, Lond*—July 4, 1913. No. 43725 A.

Tank Ships

Petroleum Transport by Sea, and the Latest Designs of Tank Ships (Der Petroleumtransport zur See, und die Neueste Entwicklung der Tankschiffe). A review of progressive development. Serial. 1st part. 2400 w. *Schiffbau*—Dec. 11, 1912. No. 39010 D.

Single-Screw Molasses Tank Steamer "Amolco." Plans and description of a vessel now under construction at Quincy, Mass. 1500 w. *Int Marine Engng*—Sept., 1913. No. 44835 C.

See also Motor Ships, under MARINE AND NAVAL ENGINEERING.

Tank Steamers

The Design and Construction of Oil Steamers. James Montgomerie. Brief review of the features of structural and other interest to be found in tank vessels. Ills. 7500 w. *Trans Inst of Engrs & Shipbldrs in Scotland*—Jan. 21, 1913. No. 40854 N.

The Design and Construction of Oil Steamers. James Montgomerie. Read before the Inst. of Engrs. and Shipbldrs. in Scotland. A brief review of the features of structural and other interest to be found in tank vessels engaged in over-

Consult Classification of the Index. See page 9.

Terminals

sea trade. Ills. 2500 w. Engng—Feb. 28, 1913. No. 40489 A.

Terminals

New Steamship Terminal at Philadelphia. H. McL. Harding. Plan and description of the Hughes Terminal, on the Delaware River. 2000 w. Int Marine Engng—March, 1913. No. 40292 C.

Torpedo Boats

U. S. S. Fanning. Henderson B. Gregory. Report of the contract trials performance of this torpedo-boat destroyer. 1000 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38295 H.

U. S. S. Jarvis. Henderson B. Gregory. Report of the contract trial performance of this torpedo-boat destroyer. 1000 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38296 H.

Tow-Boats

Experiments on the Fulton and the Froude. C. H. Peabody. An account of experiments made to investigate the characteristics of tow-boats and the determination of favorable conditions. Ills. 4000 w. Soc of Nav Archts & Marine Engrs, No. 1—Nov. 21, 1912. No. 37684 N.

Train Ferries

Railway Transport Ships at Hamburg (Die Hamburgischen Eisenbahnfährschiffe). W. Thele. Detailed description of the two double-deck self-propelled ferries in service at Hamburg. Ills. and Plates. Serial. 1st part. 4800 w. Schiffbau—Oct. 8, 1913. No. 46051 D.

Transformers

Tests on a 10000 Horse-power Föttinger Transformer. Alfred Gradenwitz. Illustrated account of tests made of this hydraulic gear for marine turbines. 1000 w. Sci Am—June 14, 1913. No. 42820.

The Latest Performance of the Föttinger Transformer (Der neueste Ausführung des Föttinger-Transformators). Wilhelm Spannake. Details of a fourteen day test of this type of hydraulic gear for marine turbines in ship propulsion. Ills. Serial. 1st part. 5500 w. Zeit des Ver deutscher Ing—May 10, 1913. No. 43010 D.

Transmitter

The Föttinger Transmitter. Describes an installation of this power into a ship for service in the South Atlantic and the Panama Canal. Ills. & Plate. 5500 w. Engng—Aug. 15, 1913. No. 44722 A.

Tugboats

The Italian Tugboat "Savoia," with Diesel Engines. Brief illustrated description. 400 w. Engng—Dec. 6, 1912. No. 38247 A.

Results of Tests Made Preliminary to the Construction of Tug Boats and Barges Designed for Service in the Port of Bor-

United States Navy

deaux (Note sur les resultats d'essais faits au sujet de la construction des remorqueurs et chalands destinés aux chautiers du port de Bordeaux). M. Le fort. Description of the tests conducted. Diagrams. 6000 w. Ann d Ponts et Chaussées—May-June, 1913. No. 43560 E + F.

Tugs

Salvage and Fire Tug "San Gerra-no." Illustrated detailed description of a recently completed vessel for service at Naples, Italy. 600 w. Engng—Nov. 15, 1912. No. 37824 A.

Side-Wheel Tug Boats "Hugo Marcus" and "Habsburg" (Seitenradschleppdampfer "Hugo Marcus" und "Habsburg."). Otto Heesch. Details of mechanical arrangements with special attention to movable paddle blades. Ills. and Plates. 2400 w. Schiffbau—Oct. 9, 1912. No. 37423 D.

Turbine Gear

Turbine Reduction Gear in Relation to Battleship Fighting Power. Explains how light reduction gear turbines would add two 14-inch guns to the "Nevada." Ills. 2000 w. Sci Am—Oct. 25, 1913. No. 46135.

Turbines

Dunlop Internal-combustion Hydraulic Turbine Transmission for Marine Propulsion. Illustrated description of this hydraulic turbine and its action. 1500 w. Mech Wld—April 25, 1913. No. 41924 A.

Steam Turbines. B. A. Strait. Describes the Curtis marine turbine, the Parsons marine steam turbine, and the Terry turbine. Ills. 2000 w. Pro U S Nav Inst—June, 1913. No. 43175 E.

A Device to Facilitate the Coupling of Cruising Turbines. Harold E. Yarrow. Read before the Inst. of Nav. Archts. Describes devices which will facilitate the coupling of the clutches. Ills. 1000 w. Mech. Engr—July 4, 1913. No. 43711 A.

Some Considerations on Turbine Driven Apparatus Installed on Warships (Alcune considerazioni sugli apparati motori a turbina installati a bordo delle navi da guerra). Giuseppe Belluzzo. A study of various turbine types and their serviceability. Ills. 5200 w. Rivista Marittima—June, 1913. No. 43587 E + F.

See also Geared Turbines, under MARINE AND NAVAL ENGINEERING; and Turbines, under MECHANICAL ENGINEERING, Steam Engineering.

United States Navy

Annual Report of the Secretary of the Navy for the Fiscal Year 1912. G. v. L. Meyer. Review of the proceedings of the year in all branches of the depart-

Ventilation

ment, with recommendations for increased fleet. 67 pp. Navy Department, Washington—Nov. 20, 1912. No. 37839 N.

Engineering Progress in the U. S. Navy. C. W. Dyson. A review of recent improvements, especially the choice of propelling machinery for heavy vessels of moderate speed. Ills. 6500 w. Soc of Nav Archts & Marine Engrs, No. 3—Nov. 21, 1912. No. 37686 N.

The Design and New Construction Division of the Bureau of Construction and Repair of the Navy Department. R. H. Robinson. Deals with methods of handling an organization engaged in design and in passing on matters of new construction. Ills. 6500 w. Soc of Nav Archts & Marine Engrs, No. 2—Nov. 21, 1912. No. 37685 N.

Ventilation

Ship Engine-Room Ventilation. Illustrated description of the new method of ventilation installed on the "Lusitania." 800 w. Engr, Lond—Aug. 29, 1913. No. 45045 A.

Yachts

The Ventilation of Modern Battleships. R. D. Gatewood and Charles M. Oman. Discusses the need of ventilation, the difficulties, the aids and methods available. 6000 w. Pro U S Nav Inst—Sept., 1913. No. 45421 E.

Yachts

The American-Built Steam Yacht Lydonia. A. S. Reed, Jr. Illustrated description of a yacht built at Wilmington, Del., and its equipment. 4000 w. Int Marine Engng—Feb., 1913. No. 39655 C.

Gas Engine Yacht. Robert MacIntyre. Illustrated description of the "Y Ddraig Goch," a Clyde-built, ocean-going, gas-engined yacht. 500 w. Sci Am—Aug. 30, 1913. No. 44898.

Development and Status of German Yachting (Entwicklung und Stand des deutschen Segelsports). F. W. von Viebahn. A review of the situation, with club memberships, some of the meets, and descriptions of representative yachts. Ills. Serial, 1st part. 3600 w. Schiffbau—Aug. 27, 1913. No. 46047 D.

MECHANICAL ENGINEERING

AERONAUTICS	237	MACHINE WORKS AND FOUNDRIES	289
AUTOMOBILES	242	MATERIALS OF CONSTRUCTION...	315
COMBUSTION MOTORS.....	262	MEASUREMENT	321
HEATING AND COOLING.....	269	POWER AND TRANSMISSION.....	328
HYDRAULIC MACHINERY.....	278	STEAM ENGINEERING.....	335
MACHINE ELEMENTS AND DE- SIGNS	283	TRANSPORTING AND CONVEYING.	351
		MISCELLANY	355

Aeroplanes

Aeroplanes

Theory of the Aeroplane (Teoria degli aeroplani). Ingino Saraceni. This first part gives brief historical sketches of the early theories. Ills. Serial. 1st part. 1500 w. Industria—April 13, 1913. No. 41536 D.

Burgess Aeroplanes. Illustrated description of a military tractor biplane, a coast-defence hydro-aeroplane, and a flying-boat. Plate. 2500 w. Engng—Oct. 3, 1913. No. 45858 A.

Air Resistance

Wind Force on Plates and other Test Materials Considering Modern Theory and Experiment (Die Windkräfte an Platten und andern Versuchskörpern nach dem heutigen Stand von Theorie und Versuch). O. Föppl. Discussion on recent experiments on air resistance. Ills. 8500 w. Zeitschr des Ver deutscher Ing—Nov. 30, 1912. No. 38463 D.

Air Friction. A. P. Thurston. Describes experiments made to determine the magnitude of the friction of air flowing over smooth surfaces and the law of its variation, in as simple a form as possible for use by engineers in the design of flying machines and other structures. 3000 w. Engng — Jan. 24, 1913. No. 39795 A.

Air Resistance and Experiments on Small Models (La résistance de l'air et les expériences sur les modèles réduits). E. Jouguet. A contributory study of the fundamental laws and air perturbations. Ills. 1500 w. Rev de Méc—Jan., 1913. No. 40588 E + F.

Airship Fabric

Airship Envelope Fabric. Reproduced from the Engng. Sup. of the London Times. Discusses its manufacture and requirements. 2200 w. Sci Am Sup—April 26, 1913. No. 41617.

Altitude

A Graphic Method for Determining the

AERONAUTICS

Aviation

Altitude of Aeroplanes. Giuseppe Pesci. Explains the construction of a nomogram which will do away with the numerical computations of formulae. 1500 w. Pro U S Nav Inst—Dec., 1912. No. 38644 E.

Altitude Recording

The Measurement of the True Static Pressure in a Moving Fluid—Application to an Aeroplane Barograph. Dr. A. F. Zahm. Indicates how to avoid or evaluate errors caused by the rush of air past the instrument. Ills. 2200 w. Jour Fr Inst—May, 1913. No. 42268 D.

Atmosphere

On the Physics of the Atmosphere. W. J. Humphreys. Gives physical explanations of atmospheric phenomena. Ills. 8500 w. Jour Fr Inst—March, 1913. No. 40881 D.

Autostable

The Autostable. W. I. Chambers. Describes Mr. Drzewiecki's tandem plane design. 1200 w. Sci Am Sup—Feb. 8, 1913. No. 39725.

Aviation

Aeronautics. Review of progress during the past year. 4000 w. Engr, Lond—Jan. 3, 1913. No. 39169 A.

Basis for Development in Aviation in 1913 (Die Grundlagen für die Entwicklung der Flugtechnik im Jahre 1913). Roland Eisenlohr. Details of the tendencies in development. Ills. 4400 w. Zeit des Ver deutscher Ing—May 31, 1913. No. 43015 D.

Maritime Aviation. René Daveluy. Discusses the form and manner in which aviation can best be adapted to the needs of the navy. 5500 w. Pro U S Nav Inst—Sept., 1913. No. 45423 E.

The New Science of Aerial Navigation (La nuova tecnica della navigazione aerea). G. A. Crocco. A review of the later theories of aerodynamics, aerotechnique and aeronautics, especially relating to dirigible construction. Ills.

Consult Classification of the Index. See page 9.

Biplanes

3000 w. Ann d Soc d Ing e d Arch Ital—Aug. 1, 1913. No. 45364 D.

Pegoud's Remarkable Performances. Illustrated account of the feats of flying upside down, looping the loop, rolling over sideways, and diving tail first in a monoplane. 1500 w. Sci Am—Oct. 18, 1913. No. 45919.

The Rheims Aviation Meeting and the Gordon Bennett Cup Race. John Jay Ide. A report of the winners with description of their machines. 3000 w. Sci Am Sup—Oct. 25, 1913. No. 46138.

Biplanes

The New 80 H. P. Farman Biplane (Der neue 80 P. S.-Farnam-Doppeldecker). Ernst Heinkel. Some of the leading points of the latest model. Ills. 1400 w. Motorwagen—April 10, 1913. No. 42134 D.

The Biggest Flying Machine in the World. Brief illustrated description of the remarkable biplane of Sikorsky, which flew over an hour with seven passengers. 1000 w. Sci Am—Oct. 11, 1913. No. 45755.

Catapult

Catapulting a Hydro-aeroplane from a Fighting Ship. Robert G. Skerrett. A review of the hydro-aeroplane development, with illustrated description of Capt. Chalmers' catapult for launching aeroplanes from battleship turrets. 1200 w. Sci Am—Dec. 14, 1912. No. 38159.

An Aeroplane Catapult. Illustrated description of the apparatus devised by Washington I. Chambers for getting hydro-aeroplanes away from a ship in the quickest manner. 1800 w. Engr, Lond—Dec. 13, 1912. No. 38531 A.

Compasses

The Compass in Aviation (Der Kompass im Flugzeug). R. Topp. Discusses the value of compasses for aviators, discussing types and methods of using. Ills. 3400 w. Motorwagen—Dec. 20, 1912. No. 39023 D.

Control

The Two-Rudder Control System of Aeroplanes. Philip Wakeman Wilcox. Illustrated description of a novel system of aeroplane control, dispensing with a vertical rudder. 3000 w. Sci Am Sup—April 5, 1913. No. 41056.

Design

Strength of Wings of Aeroplanes. A study of the stresses and how they may be met. Considers the staying of monoplane wings. 3000 w. Engng—Nov. 15, 1912. No. 37826 A.

The Theory of Aeroplane Dimensions. Abstract of observations by Archibald R. Low, which sums up much of the work

AERONAUTICS

done by French investigators. 1500 w. Engng—Jan. 10, 1913. No. 39263 A.

The Comparative Efficiency of Eiffel Surfaces. Robert D. Andrews. Studies in aeroplane design. 1000 w. Sci Am Sup—May 17, 1913. No. 42200.

Some Possible Perfections in the Aeroplane (Sur la possibilité de quelques perfectionnements à l'aéroplane). M. L. Constantin. Discusses possible changes in control and wing design, and the effects of such changes in practice. Ills. 10,000 w. Mem Soc Ing Civ de France—May, 1913. No. 43554 G.

The Laws of Similitude. L. Bairstow. Considers their application to aeroplane design. 2500 w. Sci Am Sup—Aug. 16, 1913. No. 44357.

Development

Aeroplane, Motor, or Aviator? Earle L. Ovington. An estimate of the relative importance of these three prime factors in the progress of aviation. Ills. 2000 w. Engineering Magazine—Dec., 1912. No. 37789 B.

Aeronautical Progress. J. D. Fullerton. A review of the present state of affairs, discussing probable lines of development. 15800 w. Jour Roy U Serv Inst—March, 1913. No. 41267 N.

The Present Day Development of the Aeroplane. Berry T. Stevens. Aims to show what is being accomplished in the aviation field at the present time and what can be expected of the aeroplane of the future. 1200 w. Wis Engr—March, 1913. No. 41577 C.

Dirigibles

A Method of Distributing the Suspension Load in Dirigible Construction (Sur une Méthode de répartition des suspentes dans la construction des dirigeables souples). P. Lenoir. Mathematical discussion. Diagrams. 2000 w. Tech Mod—April 1, 1913. No. 41522 D.

A Journey in a Zeppelin. Carl Dienstbach. An account of impressions of a trip in the airship "Viktoria Luise." Ills. 1500 w. Sci Am—May 17, 1913. No. 42096.

The Rigid Dirigibles "Spiess" and "Zeppelin" (Les dirigeables rigides "Spiess" et "Zeppelin"). G. Espitalier. A comparative study of French and German constructive methods as shown by these types. Ills. 7000 w. Genie Civil—May 24, 1913. No. 43083 D.

Filling and Emptying Zeppelin Air Ships (Füllung und Entleerung von Zeppelin-Luftschiffen). O. Ebersbach. Outline of the various steps to be taken. 3000 w. Der Motorwagen—June 10, 1913. No. 43536 D.

Comparison of French and German

Consult Classification of the Index. See page 9.

Engines

Strength in Dirigible Airships. A critical comparison showing why Germany is the leading air power. 1800 w. *Sci Am*—Aug. 16, 1913. No. 44351.

Over Germany in an Airship. Illustrated account of impressions by a traveller on the "Viktoria Luise." 2500 w. *Eng Rec*—Aug. 30, 1913. No. 44895.

Dissecting a Military Airship. Alfred Gradenwitz. Illustrated description of an interesting experiment with the German dirigible "VI." 600 w. *Sci Am*—Aug. 30, 1913. No. 44897.

The Latest French Dirigibles (Les Dirigeables françois les plus récents). L. Marchis. General construction and dimensions of the "Spiess," "Commandant Coutelle" and "Fleurus." Ills. 3600 w. *Tech Mod*—Sept. 1, 1913. No. 45339 D.

Engines

The Aeroplane Engine. Sidney F. Walker. Discusses the requirements of the engine and considers types, especially the Gnome engine. Ills. 2000 w. *Prac Eng*—Nov. 7, 1912. No. 37620 A.

Aviation Motors in Paris. Illustrations and critical review of types. 2500 w. *Engr*, Lond—Nov. 15, 1912. No. 37830 A.

Aeroplane Engines and Their Construction (Ueber Flugmotoren und deren Konstruktion). Julius Spiegel. Construction principles of some of the leading types of European engines. Ills. Serial. 1st part. 3500 w. *Motorwagen*—Oct. 20, 1912. No. 37458 D.

Aeroplane Engines. Reviews a paper by A. Graham Clark, read before the Inst. of Auto. Engrs., and dealing with the various aspects of aeronautical engine design. 1500 w. *Engng*—Dec. 20, 1912. No. 38891 A.

The 100 H. P. Green Aero Engine. Illustrates and describes details. 2000 w. *Autocar*—Aug. 30, 1913. No. 45024 A.

England

The Work of the Government Aeronautical Committee. A summary of the principal features appearing in the appendices to the recently issued report of the Advisory Committee for Aeronautics. 3000 w. *Engr*, Lond—Nov. 15, 1912. Serial. 1st part. No. 37828 A.

Exhibitions

The London 1912 Olympia Show (Die Londoner Olympia-Schau des Jahres 1912). K. Schirmbeck. Reviews some of the unusual features presented. Ills. 4800 w. *Zeit des Mitt Motor Vereins*—Dec. 30, 1912. No. 39027 D.

The Fourth Paris Aeronautic Exhibit (Die vierte Pariser Luftschiffahrts-Auss-

AERONAUTICS

tellung). Ansbert Vorreiter. Illustrated review of the types exhibited. Serial, 1st part. 4500 w. *Zeitschr des Ver deutscher Ing*—Jan. 18, 1913. No. 40042 D.

The Aero Exhibition at Olympia. General description and details of exhibits at an exhibition in England devoted to aeroplanes and dirigibles. Ills. 6500 w. *Engng*—Feb. 21, 1913. No. 40314 A.

Aeroplanes at the Recent Aero Exhibition at Olympia. Drawings and description of two aeroplanes exhibited, with editorial review of the Olympia Show. 4500 w. *Engng*—Feb. 28, 1913. No. 40486 A.

The Fourth Aerial Locomotion Exhibit at Paris. (Le IVe Salon de la Locomotion Aérienne, a Paris). G. Espitalier. Describes leading types exhibited at the Paris show, Oct. 27 to Nov. 10. Ills. Serial. 1st part. 7000 w. *Genie Civil*—Nov. 9, 1912. No. 37522 D.

Novelties at the Paris Aviation Show. Illustrated review of exhibits. 3000 w. *Sci Am Sup*—Nov. 30, 1912. Serial. 1st part. No. 37976.

The Fourth Paris Aviation Salon. Brief illustrated review of the show with mention of recent improvements. 1500 w. *Sci Am*—Nov. 30, 1912. No. 37973.

See also Engines, under Aeronautics.

Flight

Aerial Flight. Henry Reginald Arnulph Mallock. Considers the principles involved in ballooning and flying. 36 pp. *Inst. of Civ. Engrs*—April 19, 1912. No. 42371 N.

Flying Machines

Flying Machines. A. V. Roe. A review of the development. Ills. 5000 w. *Manchester Assn of Engrs*—March 15, 1913. No. 43294 N.

Germany

German Aeroplane Construction. 1911-1912 (Die deutschen Flugzeugbauarten, 1911-1912). Herr Eisenlohr. Reviews the chief characteristics of German construction both in monoplanes and biplanes. Illus. 3300 w. *Zeitschr des Ver deutscher Ing*—Sept. 28, 1912. No. 37444 D.

Report on the Condition of Aeronautics in Germany. Extracts from a report by the American Consul-General, Berlin, April 4, 1913. 2500 w. *Sci Am Sup*—May 24, 1913. No. 42316.

Hangars

New Hangars for Military Uses. Illustrates and describes a portable type brought out in Italy, of the Bosco and Donadelli system. 1000 w. *Sci Am*—Jan. 18, 1913. No. 39130.

The Hangar at the Potsdam Aviation Field (Die Luftschiffhalle im Luftschiff-

Consult Classification of the Index. See page 9.

Hydro-Aeroplanes

hafen zu Potsdam). Details of construction for the housing of large dirigibles adopted at Potsdam. Ills. 2700 w. Zeit des Ver deutscher Ing—May 3, 1913. No. 42145 D.

Hydro-Aeroplanes

The Donnet-Lévêque Hydro-aeroplane. John Jay Ide. Illustrated description, with scale drawings, of the most successful French flying boat, with report of trials. 1200 w. Sci Am Sup—Nov. 2, 1912. No. 37159.

Water Flight (Der Wasserabflug). M. Raabe. Discusses the various designs best suited to this service. Ills. Serial. 1st part. 3500 w. Motorwagen—Oct 31, 1912. No. 38440 D.

New French Hydro-Aeroplanes (Neue französische Wasserflugzeuge). Ernst Heinkel. Illustrated description of leading types. 2800 w. Motorwagen—Feb. 28, 1913. No. 41446 D.

The Longitudinal Stability of Skimmers and Hydro-Aeroplanes. J. E. Steele. Read before the Inst. of Naval Archts. Considers types and problems connected with their inherent stability. Ills. 2500 w. Mech Engr—April 18, 1913. Serial. 1st part. No. 41759 A.

The Construction of Hydro-Aeroplanes (La Construction des Hydraéroplanes). A. Delaunay. General description of the competitors at the Monaco meet in April and the Deauville meet in August. Ills. Serial, 1st part. 5000 w. Genie Civil—June 21, 1913. No. 43574 D.

Longitudinal Stability of Skimmers and Hydro-Aeroplanes (Die Längestabilität von Gleitbooten und Hydro-Aeroplanen). Herr Schaffren. Study of the forces exerted on the boats during high speeds. Ills. Serial, 1st part. 1700 w. Motorwagen—July 10, 1913. No. 44665 D.

Aeroplanes at the Lake Constance Water-meet, 1913 (Die Flugzeuge vom Bodensee-Wasserflug, 1913). Woland Eisenlohr. General description of the entries. Ills. 3300 w. Zeit des Ver deutscher Ing—Sept. 13, 1913. No. 46038 D.

See also Seaplane and Stability, under *Aeronautics*.

Hydroplanes

Development of the Hydroplane. Alessandro Guidoni. Abstract translation from the Italian. Discusses the difficulties of design and methods of solving the problem, the equilibrium of the apparatus, floats, etc. Ills. 3000 w. Engng—Jan. 31, 1913. No. 39805 A.

Lieut. Calderara's Hydrovol. Brief illustrated description. 500 w. Engr, Lond—Feb. 21, 1913. No. 40317 A.

AERONAUTICS**Monoplane****Italian Institute**

Institute of Italian Naval and Mechanical Engineers. Review of papers presented at the December meeting on the subject of aviation. 2500 w. Engr., Lond—Jan. 17, 1913. No. 39485 A.

Management

General Theories on the Management of the Aeroplane (Théorie générale des régimes de l'aéroplane). Georges de Bothezat. Discusses the management of aeroplanes in flying, ascending and descending in calm air and in steady breezes. Diagrams. 13000 w. Rev de Mecan—Apr. 30, 1913. No. 43060 E + F.

Meteorology

The Airman and the Weather. Charles Fitzhugh Talman. The important part aeronautic meteorology is destined to play in the navigation of the air. Ills. 2000 w. Sci Am—Aug. 2, 1913. No. 44074.

Military

The Military Aeroplane Competition. Editorial review of the recently issued report of the competition held last August. 1500 w. Engng—Nov. 8, 1912. No. 37642 A.

Bomb-Throwing from Aeroplanes (Bombenwerfen aus Flugzeugen). Hans Zeyssig. Discusses and describes recent tests. Ills. Serial. 1st part. 3200 w. Motorwagen—Oct. 31, 1912. No. 38439 D.

Achievements of Military Aircraft. H. Bannerman-Phillips. Considers lessons taught by the European manoeuvres and by military campaigns. Ills. 3300 w. Sci Am—April 5, 1913. No. 41038.

Possibilities of Air Warfare. C. W. Smith. Discusses some of the possible terrors of such a contest. 1800 w. Yale Sci M—April, 1913. No. 42581 C.

The Work of Aircraft in the French Manoeuvres, 1913. H. Bannerman-Phillips. Shows the aeroplanes were extremely useful. Ills. 2500 w. Sci Am—Oct. 25, 1913. No. 46137.

Models

The Laws of Similitude. L. Bairstow. Lecture before the Aeronautical Soc. of Gt. Britain. Shows the intimate connection of laws of similitude which constitute the theory of the use of models, and aerodynamics. Ills. 2500 w. Engng—Feb. 14, 1913. No. 40133 A.

Monoplanes

The Etrich Monoplanes. Stanley Yale Beach. Illustrates and describes several of the latest aeroplanes of the Austrian pioneer. 1200 w. Sci Am Sup—Jan. 18, 1913. No. 39178.

The Monoplane "Colombia" (Monoplane "Colombia"). Francisco A. Pinto Groot. Plans and description of an unusual type, having close-fitting planes

Consult Classification of the Index. See page 9.

Motor Design

and double-pointed empennage. Ills. 1500 w. *Anales de Ingeniería*—Jan., 1913. No. 39077 D.

The Moreau Automatically Balanced Monoplane. Illustrated description of a monoplane provided with an automatic stabilizer, which has been tested in Paris. 1200 w. *Sci Am*—Feb. 8, 1913. No. 39717.

The Morane-Saulnier Monoplane. John Jay Ide. Detail drawings and illustrated description of this racer in its present form, and brief reference to other types. 2000 w. *Sci Am Sup*—March 15, 1913. No. 40640.

The Hanriot-Ponnier Monoplane (Eindecker Hanriot-Ponnier). A. Dumas. Description of method of stabilizing, wings, body, and construction of this new French model. Ills. and Plates. 2200 w. *Motorwagen*—May 20, 1913. No. 43028 D.

Motor Design

The Royal Prize Competition for the Best German Aeroplane Motor (Der Wettbewerb um den Kaiserpreis für den besten deutschen Flugmotor). Hugo H. Kroner. Details of qualifications and tests, and description of Benz motor, which won first prize. Ills. Serial. 1st part. 2200 w. *Elek Rund*—March 27, 1913. No. 41475 D.

Performance and Results of the Competition for the Royal Prize for the Best German Aeroplane Motor (Die Durchführung und das Ergebnis des Wettbewerbes um den Kaiserpreis für den besten deutschen Flugzeugmotor). F. Bendemann. The conditions of the competition; the tests made, and results. Serial. 1st part. 6600 w. *Zeit des Ver deutscher Ing*—March 29, 1913. No. 41465 D.

Data from Germany Aviation Motor Contest of Interest to Builders of Modern Automobile Motors. Observations from report of progress. Considers the disposal of heat-absorbed by the piston head one of the main factors. Ills. 3000 w. *Automobile*—Oct. 16, 1913. No. 45902.

Motors

Testing Plant for the Imperial Prize Competition for the Best German Aeroplane Motor (Die Versuchsanlage für den Wettbewerb um den Kaiserpreis für den besten deutschen Flugzeugmotor). F. Bendemann. Outlines the tests to be made, and testing apparatus for the models submitted. Ills. 6600 w. *Zeitschr des Ver deutscher Ing*—Nov. 16, 1912. No. 38447 D.

The Gyroscopic Action of Rotary Motors in Aeroplanes. Herbert Chatley. A. discussion of the effects. 800 w. *Engng*—Feb. 7, 1913. No. 39919 A.

AERONAUTICS

The Rotating Cylinder Motor. Lenox R. Lohr. Illustrated discussion of motors of this type, their faults, and the future outlook. 2000 w. *Sib Jour of Engng*—March, 1913. No. 40924 C.

Propellers

Whirling-Table at East London College. A. P. Thurston. Illustrates and describes a simple, cheap, and effective whirling-table for propeller and aeroplane tests. 2000 w. *Engng*—Nov. 8, 1912. No. 37637 A.

Propellers for Aeroplanes. G. Eiffel. A résumé of the experiments of capacity and powering made at the laboratory of the Champ de Mars. Editorial note. 3000 w. *Cassier's Mag*—Nov., 1912. No. 38363 B.

Saint-Cyr

Aerotechnique Studies at the Saint-Cyr Institute (Les Etudes d'Aerotechnique a l'Institut de Saint-Cyr). Ch. Maurain. The object of the institute and a review of the aerotechnical experiments made in this well-equipped research laboratory. Ills. 7200 w. *Rev gen des Sciences*—March 30, 1913. No. 41510 D.

Scientific Instruments

Scientific Instruments: Their Design and Use in Aeronautics. Horace Darwin. The first Wilbur Wright memorial lecture. A discussion of instruments used on aeroplanes. Ills. 7000 w. *Jour Soc of Arts*—July 4, 1913. No. 43701 A.

Scientific Instruments: Their Design and Use in Aeronautics. Horace Darwin. Lecture before the Aeronautical Soc. of Gt. Britain. A discussion of instruments used on aeroplanes and the difficulties in designing and using. Ills. 4500 w. *Engng*—May 23, 1913. Serial. 1st part. No. 42780 A.

Seaplane

100 Horse-Power Avro Seaplane. Illustrated description of a type similar to those built for the German Government. 700 w. *Engr, Lond*—Oct. 3, 1913. No. 45869 A.

Service

Non-stop Delivery to Aeroplanes. From *Aeronautics*. Illustrated description of a proposed device for taking on board supplies while in full flight. 2000 w. *Sci Am Sup*—Nov. 23, 1912. No. 37737.

Speed

The Speed Limitations of Air Travel. R. Emerson. Lessons from the International Races at Chicago during the summer. Ills. 3300 w. *Cassier's Mag*—Oct., 1912. No. 37152 B.

Stability

Stability, Relations between Stability and Safety (Stabilité, Relations de la Stabilité et de la Sécurité). L. Girard-

Stability

ville. Discusses design of aeroplanes tending toward elimination of accident due to air currents. 4400 w. *Mem Soc Ing Civ de France*—Sept., 1912. No. 37486 G.

Stability Devices for Aeroplanes. Merwyn O'Gorman. Considers devices aiming to secure safety in the air, discussing speed, air disturbances, screw propulsion, etc. 7500 w. *Engng*—Jan. 31, 1913. No. 39803 A.

The Longitudinal Stability of Skimmers and Hydro-Aeroplanes. J. E. Steele. Read before the Inst. of Nav. Archts. Reports an investigation of machines coming under these heads, considering each type in detail. Drawings. 4000 w. *Engng*—March 21, 1913. No. 41016 A.

On the Static Longitudinal Stability of Aeroplanes (Ueber die statische Längsstabilität der Drachenflugzeuge). Carl Weselsberger. Results of experiments made at München on a dragon-fly shaped model. Ills. 4400 w. *Zeit des Ver deutscher Ing*—March 29, 1913. No. 41467 D.

General Theory on the Stabilizing Action of the Horizontal Planes of the Aeroplane (Théorie générale de l'action stabilisatrice des empennages horizontaux de l'aéroplane). Georges de Bothezat. From general observation on the diverse methods of effecting aeroplane stability. Diagrams. 15000 w. *Rev de Mecan*—Aug. 31, 1913. No. 45359 E + F.

The Sperry Aeroplane Stabilizer. Explains the great importance of automatic stabilizing, and gives illustrated description of the invention of Elmer A. Sperry, and its working. 2500 w. *Engr, Lond*—June 6, 1913. No. 42890 A.

Making the Aeroplane Safe by the Gyroscopic Stabilizer. Robert G. Skerrett. Description of the Sperry gyroscopic aeroplane stabilizer. Diagram. 1500 w. *Sci Am*—June 7, 1913. No. 42666.

Stability in Flying Machines. Albert

AUTOMOBILES

Agricultural Motors

Adams Merrill. Analyzes the forces involved in flying in order to determine if, by changing the design of machines, it is possible to make flying safer. 4500 w. *Jour Am Soc of Mech Engrs*—Oct., 1913. No. 46139 D.

See also *Autostable and Monoplanes, under Aeronautics.*

Stabilizers

See also *Hydro-Aeroplanes, under Aeronautics, and Gyroscopes, under Machine Elements and Design.*

Stream Lines

Stream Lines Around Obstacles to Air Currents. Describes methods used to obtain records of air movement. Ills. 1200 w. *Sci Am Sup*—April 26, 1913. No. 41616.

Stresses

Stress Considerations in Aeroplane Design. Dr. A. F. Zahm. Considers some of the questions which can be answered directly by simple analysis. Ills. 4000 w. *Jour Fr Inst*—June, 1913. No. 43248 D.

United States

Aviation Today, and the Necessity for a National Aerodynamic Laboratory. W. Irving Chambers. An appeal for national research and verification facilities in a well-equipped United States laboratory. 10500 w. *Pro U S Nav Inst*—Dec., 1912. No. 38643 E.

Velocities

Aeroplanes and Dirigibles (Aeroplani e Dirigibile). A. Guidoni. A study of comparative velocities. Diagrams. 3600 w. *Rivista Marittima*—March, 1913. No. 42199 E. & F.

Warfare

Fighting in the Air. Carl Dienstbach. Remarks on tests made to determine an airship's ability to defend itself against aeroplanes, and other forms of aerial contests. 1500 w. *Sci Am*—Aug. 2, 1913. No. 44072.

AUTOMOBILES

Abbott

Six-Cylinder Abbott Added for 1914. Illustrated description of interesting details of the latest model. 1800 w. *Automobile*—Aug. 21, 1914. No. 44531.

Accelerometer

Detecting Resistance—Saving Fuel. W. C. Marshall. Describes the accelerometer, which gives a complete check on the motor and running gear. Ills. 2200 w. *Automobile*—April 17, 1913. Serial. 1st part. No. 41342.

Accumulators

Instructions for the Installation and Care of Storage Batteries Used in Con-

nection with Electric Starting and Lighting Systems on Automobiles. 1000 w. *S A E Bul*—Aug., 1913. No. 45092 N.

Agricultural

Machines at the General Agricultural Show (Les machines au concours général agricole). H. Pillard. A review of the tractors, motor plows, etc., exhibited in the 1913 show. Ills. Serial. 1st part. 4000 w. *Tech Mod*—May 1, 1913. No. 42178 D.

Agricultural Motors

Agricultural Motor Development in Europe. Brief descriptions of types of

Consult Classification of the Index. See page 9.

Agriculture

motor plows, motor cultivator, and subjects considered at meeting of the French Motor Culture Assn. Ills. 2200 w. Horseless Age—Oct. 15, 1913. No. 45994. See also Motor Plows, under *Automobiles*.

Agriculture

Gasoline and Oil Power on the Farm. Philip S. Rose. Explains how engines have lightened farm work. Ills. 1600 w. Sci Am—Feb. 1, 1913. No. 39609.

Alco

Alco for 1913 Possesses Many New Features. Illustrated detailed description of latest model. 2000 w. Horseless Age—Nov. 6, 1912. No. 37361.

Alda

Alda Cars. Illustrated description of a new high-grade French car. 1500 w. Auto Jour—May 17, 1913. No. 42525 A.

Ambulances

The Automobile in Service of the Sick and Injured (Das Automobil in Kranken-transport- und Unfalldienst). Hr. Blumenthal. Description of a number of German motor ambulances in hospital and veterinary service. Ills. 2700 w. Auto Rund—Sept. 15, 1913. No. 46056 D.

Anti-vibrator

The Lanchester Anti-vibrator. F. W. Lanchester. Brief description of a system of securing perfect balance on four-cylinder engines. Ills. 1000 w. Autocar—Jan. 25, 1913. No. 39765 A.

Argyll

The 15-30 h. p. Sleeve Valve Argyll. Illustrated description of this new model. 1200 w. Autocar—Nov. 9, 1912. No. 37626 A.

The 15-30 h.p. Sleeve Valve Argyll. Illustrates and describes the interesting features. 2200 w. Autocar—March 15, 1913. No. 40802 A.

Armstrong-Whitworth

The 30-50 h. p. Six-cylinder Armstrong-Whitworth. Illustrated detailed description. 1000 w. Autocar—May 17, 1913. No. 42527 A.

Arrol-Johnston

The 15.9 h. p. Arrol-Johnston. Brief illustrated description of the four-cylinder, four-speed car. 1000 w. Autocar—May 10, 1913. No. 42272 A.

Atmospheric Changes

Notes on Power Variation with Atmospheric Changes. Herbert Chase. Reports results of tests made. 700 w. S A E Bul—Sept., 1913. No. 46121 N.

Austro-Daimler

The 27-80-H.P. Austro Daimler. Illustrates and describes details of an interesting car. 1000 w. Auto Jour—Feb. 1, 1913. No. 39770 A.

Automobile Engineers

Training of Automobile Engineers. B.

AUTOMOBILES

W. Ainsworth, H. Burchell, C. E. G. House, and G. Campbell Taylor. Read before the Inst. of Auto. Engrs. Discusses the need of specialized training and what it should embrace. 3500 w. Auto Jour—Jan. 11, 1913. No. 39245 A.

Balancing

The Balance of Rotating Cylinder Engines. H. Grinstead. A mathematical study. Ills. 3000 w. Horseless Age—June 18, 1913. No. 42979.

Batteries

1913 Vehicle Batteries. Information concerning types of batteries most in use. 2500 w. Automobile—Jan. 2, 1913. No. 38823.

The Philadelphia Thin Plate Battery. Explains its characteristics and the reasons for its success. Ills. 3500 w. Horseless Age—March 5, 1913. Serial. 1st part. No. 40363.

Batteries. C. C. Munson. Discusses the requirements for a lighting or ignition system to get the best results, also general discussion. 6200 w. S A E Bul—April, 1913. No. 42342 N.

Thin Plate is Latest Battery Development. Discusses the construction and operation of the electric vehicle storage battery, comparing thick and thin plate types. Ills. 2200 w. Automobile—Oct. 23, 1913. No. 46155.

See also Motor Trucks, under *Automobiles*.

Battery Charging

A Vibrating Rectifier. Q. A. Brackett. Illustrates and describes a device for changing alternating current of standard voltage to low-voltage direct-current for automobile lighting systems. 2500 w. Elec Jour—Dec., 1912. No. 38625.

Rheostats for Battery Charging. Illustrated description of a solenoid-operated rheostat for automatic regulation or current. 2000 w. Automobile—Jan. 2, 1913. No. 38821.

Motor-Generators and Rectifiers. Illustrates and describes apparatus for charging batteries at home from alternating-current mains. 2500 w. Automobile—Jan. 2, 1913. No. 38820.

Charging a Battery. A practical outline of the best method. 2500 w. Automobile—Jan. 2, 1913. No. 38822.

Bayard

The 12-H.P. Bayard Car. Illustrated detailed description of a new French car. 1200 w. Auto Jour—March 22, 1913. No. 40998 A.

Bearings

Utility of Double Purpose Bearings in Automobile Mechanism. C. F. Olin. Discusses the properties of this type of bearings with example of its application in

Consult Classification of the Index. See page 9.

Berliet

automobile construction. Ills. 3500 w. Horseless Age—March 5, 1913. No. 40364.

Timken Roller Bearings. Illustrates and describes the theory and method of their construction. 4500 w. Autocar—April 5, 1913. No. 41217 A.

Berliet

The 20-25 H. P. Berliet. Illustrated description of a French model shown at Olympia. 1200 w. Auto Jour—Nov. 9, 1912. No. 37630 A.

Biautogo

The Biautogo. Illustrated description of a car on two wheels, with an 8-cylinder engine, 4 speeds and reverse, a compressed air engine-starter, and an electric lighting system. 1800 w. Autocar—Aug. 16, 1913. No. 44707 A.

Bodies

The All Metal Body. G. E. Watts. Explains advantages and discusses types. Also describes a British all metal body. Ills. 1500 w. Horseless Age—Nov. 20, 1912. No. 37769.

Some Notes About Body-work at Olympia. An illustrated criticism dealing with interesting details of design. 7500 w. Autocar—Dec. 7, 1912. No. 38228 A.

Limousine and Landaulet Types Combined. Illustrated description of a new type of all-season body. 1300 w. Automobile—March 20, 1913. Serial. 1st part. No. 40751.

The Use of Sheet Metal on Bodies (Die Herstellung von Blechkörpern). August Bauschlicher. General remarks on the utility of sheet metal for various parts of the car body, and notes on shaping and securing. Ills. 4400 w. Motorwagen—Aug. 10, 1913. No. 44666 D.

Brakes

Method of Brake Capacity Determination. S. I. Fekete. Gives a study of brake resistance. 1200 w. S A E Bul—Dec., 1912. No. 39303 N.

Jackshaft vs. Double Rear-Wheel Brakes. Arthur M. Laycock. An investigation from a designer's outlook. 2200 w. S A E Bul—May, 1913. No. 42474 N.

Jackshaft vs. Double Rear Wheel Brakes. Arthur M. Laycock. Read before the Soc. of Auto Engrs. Investigation, from the designer's viewpoint, showing the disadvantages of jackshaft brakes. 2500 w. Automobile—Aug. 7, 1913. No. 44233.

See Gear Changing, under *Automobiles*.

Cabriolet

The Cabriolet—A New Body Type. George J. Mercer. Illustrates and describes a fully collapsible closed body.

AUTOMOBILES

2500 w. Automobile—Sept. 25, 1913. No. 45432.

Cadillac

The Cadillac. Illustrates and describes interesting features. 2000 w. Auto Jour—July 5, 1913. No. 43703 A.

Carbon Deposits

Carbonization of Motors and Its Remedies. Albert L. Clough. Considers the solvent, mechanical and combustion methods of decarbonizing, comparing their efficiency. 2000 w. Horseless Age—Aug. 27, 1913. No. 44872.

Carburetion

The Problem of Carburetion in Its Most Recent Aspects. Albert L. Clough. Claims that decreased volatility of the fuel has lowered the fuel economy and pre-heating of the charge is required to secure the best results. 2500 w. Horseless Age—Nov. 13, 1912. No. 37588.

Carburetion. Robert W. A. Brewer. A study of the subject. 1500 w. Automobile—Nov. 14, 1912. Serial. 1st part. No. 37573.

A Consideration of Certain Problems of Carburetion. Arthur B. Browne. Considers the law of gravity applied to carburetion, effect of temperature, application of the law to various types, etc. Ills. 3000 w. S A E Bul—May, 1913. No. 42475 N.

The Effect of Carburetor Improvements in Quieting Motor Operation. Albert L. Clough. Discusses the remarkable increase in quietness attained and how much of it is attributable to the carburetor and to improved manifolds. 1800 w. Horseless Age—May 28, 1913. No. 42630.

Valve Timing and Fuel Economy. Discusses the importance of correctly designed cams to ensure good carburetion. 3000 w. Autocar—Oct 4, 1913. No. 45836 A.

Carburetors

The Brewer Efficiency Carburettor. Illustrated description of a design aiming to supply a correctly proportioned gaseous mixture at all speeds. 1500 w. Autocar—Jan. 25, 1913. No. 39766 A.

The Racing Claudel Carburettor. Illustrated description of the carburettor used by the winners of the Grand Prix and the Coupe de L'Auto. 1200 w. Autocar—Feb. 1, 1913. No. 39768 A.

Dash Adjustment of the Carburetor. Albert L. Clough. Brief consideration of possible adjustments and the effect on fuel consumption. 1200 w. Horseless Age—March 19, 1913. No. 40752.

Rayfield Carburetors and How They Are Made. Illustrated detailed description of this carburetor and the methods

Carburetors**AUTOMOBILES****Commercial Vehicles**

of manufacture. 3000 w. Horseless Age—March 12, 1913. No. 40674.

The Molsinger Carburetor and Its Development. Explains the theory of a device based on the principle of proportional opening of fuel and air valves. Ills. 4500 w. Horseless Age—March 19, 1913. No. 40753.

The S. U. Carburetor. Brief illustrated description of a simple and entirely automatic type. 800 w. Auto Jour—March 1, 1913. No. 40462 A.

Feps Carburetors and Their Manufacture. Illustrated description of the factory methods and the testing apparatus used. 2500 w. Horseless Age—March 26, 1913. No. 40931.

Kerosene Carburetors. A. C. Bennett. An account of investigations, describing the present method of vaporization, the difficulties encountered, etc. Discussion. 3500 w. S A E Bul—March, 1913. No. 41259 N.

The Smith Carburetor. Illustrated description of the A and B types and the method of operation. 1200 w. Auto Jour—June 28, 1913. No. 43619 A.

Carburetors or Vaporizers?—Lean Mixtures or Rich? S. M. Udale. A discussion of factors in the carburization of automobile fuels, based on exhaust gas analysis, explaining how such analyses are made. Ills. 3500 w. Horseless Age—Aug. 6, 1913. No. 44231.

New English and French Carburetors (Neue englische und französische Vergaser). General description of eight leading types. Ills. 1500 w. Auto Rundschau—July 30, 1913. No. 44661 D.

Some of the Difficulties of Kerosene Carburation. P. S. Tice. Gives a summary of the physical properties of kerosene, discussing those that have made it difficult to develop a kerosene carburetor. General discussion. 6500 w. S A E Bul—Aug., 1913. No. 45089 N.

The Truth About the Kerosene Carburetor. George M. Holley. Gives results obtained in tests, illustrating and describing a new carburetor. 1800 w. Horseless Age—Oct. 8, 1913. No. 45771.

The New Binks Two-jet Carburetor. Illustrated description showing how waste of fuel is prevented by automatically closed jets. 1500 w. Autocar—Oct. 4, 1913. No. 45837 A.

See also Exhaust, under *Automobiles*.

Care

Cleaning and Care Taking of Automobiles. M. C. Hillick. Directions for preserving the finish and appearance. 1800 w. Horseless Age—June 11, 1913. No. 42810.

Car-Lighting

New French Car-Lighting Dynamos.

Illustrates and describes two machines of recent design—the "Grada" and the "Stereos" dynamos. 1500 w. Elec Rev, Lond—Aug. 29, 1913. No. 45029 A.

See also Electric Equipment, under *Automobiles*.

Chain Drives

Adjusting Silent Chain Drives for Camshafts. Explains why adjustment is necessary and describes means found on various English and Continental engines. Ills. 2000 w. Horseless Age—July 2, 1913. No. 43441.

Chalmers

Coupé Design for 1912 Chalmers Chassis. George G. Mercer. Gives scale drawings and details of a light 4-passenger body for winter travel. 2000 w. Automobile—Nov. 7, 1912. No. 37326.

Chassis Testing

Modern Chassis Testing. P. P. Dean. Illustrated description of a new chassis testing apparatus intended to do away with road testing. 1500 w. Horseless Age—April 9, 1913. No. 41157.

Clutches

The Design of Clutch Release Shoes. M. Ferry. Gives a method of determining the proper distribution of bearing pressure and wear. Ills. 1000 w. Mach, N Y—Jan., 1913. No. 38718 C.

Coal Fuel

See Fuel, under *Combustion Motors*.

Coasting

How to Coast an Automobile. Albert L. Clough. Gives three methods of coasting, comparing their advantages. 1500 w. Horseless Age—Oct. 22, 1913. No. 46195.

Cole

Roustabout and Coupé for 1912 Cole. George G. Mercer. Illustrates and describes a runabout model that can be converted into a closed car for winter. 1800 w. Automobile—Nov. 14, 1912. No. 37574.

Stream-Line Bodies and Left Hand Drive Characterize New Cole Models. Illustrates and describes details of the new models. 1500 w. Horseless Age—July 23, 1913. No. 43867.

Combustion

Temperature Limits in Combustion. Robert W. A. Brewer. Shows that air dilution sets limits of explosion and unexplosion. 1800 w. Automobile—Oct. 2, 1913. No. 45629.

Commercial Vehicles

New York's Gigantic Commercial Vehicle Exhibition Under Way. Illustrated review of the vehicles on exhibition at Madison Sq. Garden and the Grand Central Palace in New York City. 7000

Consult Classification of the Index. See page 9.

Control

w. Horseless Age—Jan. 22, 1913. No. 39284.

New York's Truck Show Opens. Illustrates and describes commercial vehicles exhibited at Madison Sq. Garden and Grand Central Palace, New York City. 4000 w. Automobile—Jan. 23, 1913. No. 39492.

Commercial Vehicles at the Paris 1912 Salon (Les véhicules industriels au Salon de l'Automobile, à Paris, en 1912). D. Duane. General résumé of cars on exhibition. Ills. 4000 w. Genie Civil—Dec. 21, 1912. No. 39086 D.

Mechanical Observations of the Commercial Car Show. Illustrated review of new features. 5000 w. Horseless Age—Jan. 29, 1913. No. 39573 C.

The Motor Driven Commercial Vehicle. Ross Babcock. Illustrated discussion of methods of drive in commercial vehicles. 1500 w. Sci Am—Oct. 25, 1913. No. 46187.

Control

Dangers of Non-Standardized Control. Albert L. Clough. Shows the danger of driving cars other than the one with which motorists are familiar. 2000 w. Horseless Age—June 18, 1913. No. 42980.

Cooling

Some Notes on Water Cooling. Dr. A. M. Low. Shows the advantage to be gained from cooling by internal injection and the principles and parts involved. Ills. 2200 w. Autocar—Aug. 16, 1913. No. 44706 A.

Costs

Cost of Up-Keep of Horse-Drawn Vehicles Against Electric Vehicles. W. R. Metz. Considers the motor-driven vehicle unquestionably cheaper, and the electric vehicle better for city service. The gasoline-driven machines better for long hauls over rough roads. 2500 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41294 D.

Comparative Cost of Automobiles and Horses. Gives figures from 46 cities, giving cost of maintenance during the past year, showing automobiles cheaper in every case. 3500 w. Munic Jour—Aug. 28, 1913. No. 44798.

Cost of Upkeep of Horse-Drawn Vehicles Against Electric Vehicles. W. R. Metz. Discussion of W. R. Metz's paper. 3500 w. Jour Am Soc of Mech Engrs—Aug., 1913. No. 44514 D.

Cost Systems

Locomobile Truck System. Explains the cost keeping system devised for users of Locomobile trucks. 1600 w. Automobile—May 15, 1913. No. 42086.

Cycar

Cycar. Illustrated detailed description

AUTOMOBILES

Design

of this cycle-car. 1500 w. Auto Jour—May 24, 1913. No. 42740 A.

Cyclecars

The Chota Cyclecars. Illustrated description of a car in which simplicity and low running expenses are the essential features. 1600 w. Auto Jour—July 12, 1913. No. 43889 A.

Cyclecars—American and Foreign. Illustrates and describes small cars developed from the motorcycle. 1400 w. Sci Am—Oct. 4, 1913. No. 45614.

Cylinders

The Most Efficient Stroke-Bore Ratio. E. P. Batzell. Gives reasons why medium stroke-bore ratio is best. 2000 w. Automobile—Aug. 7, 1913. Serial, 1st part. No. 44363.

Daimler

The Daimler Motor Omnibus and 3-Ton Lorry Chassis. Illustrated detailed description. Plate. 5000 w. Engng—Jan. 3, 1913. No. 39156 A.

New Motor-Omnibus by the Daimler Company in Coventry (Der neue Motor-Omnibus der Daimler Company in Coventry). Details of this new English car. Ills. Serial. 1st part. 3500 w. Motorwagen—Feb. 20, 1913. No. 40545 D.

Darracq

The New 16-H. P. Darracqs. Illustrated detailed description of this French car with critical remarks. 1500 w. Auto Jour—June 7, 1913. No. 42873 A.

Depreciation

Calculating Depreciation of Commercial Automobiles. Charles Wheeler. Brief consideration of methods. 1000 w. S A E Bul—May, 1913. No. 42472 N.

Design

The Design of Motor Vehicles. H. E. Wimperis. Gives the writer's solution of the problem of finding a fundamental basis for design. 2500 w. Engr, Lond—Nov. 15, 1912. No. 37827 A.

English Car Tendencies for 1913. J. S. Critchley. First report of the annual Olympia exhibition which opened in London, Nov. 8. Ills. 7500 w. Automobile—Nov. 14, 1912. No. 37572.

The French School of Engineering. Analyzes features of French designs. Ills. 3000 w. Automobile—Nov. 28, 1912. Serial. 1st part. No. 37934.

The Future Car. Walter Baunard. Illustrated review of the development of car bodies at home and abroad. 2200 w. Sci Am—Jan. 11, 1913. No. 39100.

Motor Cars (Kraftwagen). Dr. Riedler. A treatise written at the suggestion of Prince Henry of Prussia, taking up in detail the principles governing the design of automobiles. Ills. Serial. 1st part.

Consult Classification of the Index. See page 9.

Details

AUTOMOBILES.

Electric Vehicles

5000 w. Zeit d Mitt Motorwagen Ver—
March 1, 1913. No. 41449 D.

The Influence of the Sales Department
on the Design of Motor Cars. F. E.
Moskovics. Discerns the influence that
the sales department may bring to bear
on the engineering department, and the
advantages of closer contact. 3500 w.
S A E Bul—May, 1913. No. 42478 N.

A Briton's American Notes. Informa-
tion gleaned on a recent tour of Ameri-
can automobile factories in regard to de-
signing and producing cars. 9500 w. S
A E Bul—Sept., 1913. No. 46119 N.

See also Engine Design, under *Auto-
mobiles*.

Details

Little-Known Details. Illustrates and
describes interesting details from well-
known cars. 1000 w. Auto Jour—Jan.
11, 1913. No. 39243 A.

Development

The Automobile as a Product of Re-
search and Investigation. R. C. Carpen-
ter. From a lecture before the Sigma Xi
Soc. An interesting review of the de-
velopment. 2500 w. Sib Jour of Engng
—June, 1913. No. 43182 C.

Devices

Clever Devices that Help Motorists.
Illustrates and describes European in-
ventions that meet real needs. 1000 w.
Sci Am—Jan. 11, 1913. No. 39105.

Differential Locks

The Differential Lock. A. C. Wood-
bury. Explains its purpose and the ad-
vantages and objections of its use. Ills.
1800 w. Horseless Age—July 23, 1913.
No. 43868.

Differentials

The Double Direct Drive. A. C.
Woodbury. Illustrated technical review
of various designs, the difficulties en-
countered and suggestions for overcom-
ing them, and a description of the Cadil-
lac system. 3500 w. Horseless Age—
Aug. 27, 1913. No. 44871.

Economy

How to Obtain Gasoline Economy.
Arthur Holmes. Suggestions for economy
in the operation of an automobile. 1200
w. Horseless Age—March 26, 1913.
No. 40929.

Edwards-Knight

Edwards-Knight, the Latest Arrival in
Motordom. Illustrated detailed descrip-
tion of this new pleasure car. 800 w.
Horseless Age—Dec. 11, 1912. No.
38169.

Electric Equipment

The Gray and Davis Electric Outfit.
Illustrated description of a lighting dyna-
mo and engine starting motor as sepa-

rate units. 1000 w. Autocar—Sept. 6,
1913. No. 45139 A.

Electric Motors

An A B C of the Electric Motor. Syd-
ney Oxberry. Gives an outline of the
magnetic principles involved. Ills. 2500
w. Automobile—Oct. 23, 1913. No.
46154.

Electric Outfits.

Electric Starting and Lighting. J. W.
Fitzgerald. Discusses the requirements
and the mechanical and electrical work-
manship of such outfits. 2500 w. S A E
Bul—Feb., 1913. No. 40394 N.

Electric Systems

Electric Lighting and Motor Starting.
Chester S. Ricker. Illustrates and de-
scribes the electric apparatus used on
gasoline cars. 2000 w. Horseless Age—
March 26, 1913. Serial. 1st part. No.
40934.

The U. S. L. Electric Starting and
Lighting System. Illustrated detailed de-
scription of this system as applied to gas-
oline automobiles. 2000 w. Horseless
Age—March 26, 1913. No. 40932.

The Ward Leonard Electric Starting
and Lighting System. Illustrated article
describing this system and giving infor-
mation concerning it. 2500 w. Horseless
Age—April 16, 1913. No. 41330.

The Jesco Electric Starting and Light-
ing System. Illustrated detailed descrip-
tion of this system. 2500 w. Horseless
Age—April 23, 1913. No. 41611.

The Bailey Lighting, Starting and Ig-
nition System. Illustrated description of
a new system designed by Benjamin F.
Bailey. 3500 w. Horseless Age—June
18, 1913. No. 42978.

The Disco Lighting and Starting Sys-
tem. Describes the 6-volt and the 12-
volt systems, and the apparatus. Ills.
1500 w. Horseless Age—July 16, 1913.
No. 43748.

The Elyria-Dean Starting and Lighting
Systems. Illustrated description of the
system with directions for its use. 1700
w. Horseless Age—July 9, 1913. No.
43670.

Electric Trucks

The Electric Truck: English Experi-
ments and American Practice. Illus-
trated account of the progress of these
vehicles in the United States, and com-
parison with England. 3000 w. Elec
Rev, Lond—Oct. 3, 1913. No. 45838 A.

Electric Trucking. Editorial on the
handling of goods in railway warehouses,
and the use of electric battery trucks in
America. 1500 w. Engng—Oct. 10, 1913.
No. 45985 A.

Electric Vehicles

The Electric Vehicle from an Insur-
ance Standpoint. Carl H. Clark. Read

Consult Classification of the Index. See page 9.

Electric Vehicles

before the Elec. Veh. Assn. Discusses causes of loss and desirable features from an insurance point of view. 2000 w. Horseless Age—Oct. 30, 1912. No. 37202.

Further Progress in the Development of the Electric Vehicle Business in America. Douglas Sutherland Martin. Reviews what has been done and shows the value of co-operation. 2200 w. Elec Rev, Lond—July 11, 1913. Serial, 1st part. No. 43891 A.

Electric Automobiles. W. H. L. Watson and R. J. Mitchell. Considers the possibilities of the employment of electric vehicles in England, showing the suitability and giving results of operation. Discussion. 5500 w. Elect'n, Lond—June 20, 1913. No. 43377 A.

The Electric Vehicle. Stephen G. Thompson. A comparison with gasoline vehicles, giving preference to the electric in city service. 1500 w. Can Elec Assn—June, 1913. No. 44811 N.

The Electric Vehicle. J. W. Beauchamp. Discusses its limitations and selling points for the English market. 2500 w. Elec Rev, Lond—Aug. 8, 1913. No. 44446 A.

Electric Vehicles from the Central Station Point of View. C. Rummel. Discusses the economy of electric cars of the commercial type. 2000 w. Can Elec Assn—June, 1913. No. 44817 N.

Electric Trucks in Freight House Service. Shows that the use of these trucks in railway and steamship service give greatly increased efficiency. Ills. 2000 w. Ry Age Gaz—Aug. 8, 1913. No. 44260.

Central Station Co-operation in the Electric Vehicle Industry. Douglas Sutherland Martin. Discusses economics obtainable by increasing the off-peak load. 5500 w. Engineering Magazine—Oct., 1913. No. 45542 B.

E. M. F.

Hansom Type Coupé for E. M. F. Chassis. George G. Mercer. Scale drawings and description of a proposed design. 1600 w. Automobile—Nov. 28, 1912. No. 37933.

Empire

Details of the New Empire, Model 31. Illustrated description of a five-passenger touring car. 1500 w. Horseless Age—March 26, 1913. No. 40930.

Engine Bearings

Automobile Engine Bearings. E. B. Van Wagner. Brief discussion of their design, material, wear, structure, temperature, cost, etc. 1500 w. S A E Bul—April, 1913. No. 42336 N.

Engine Cooling

See Cooling, under *Combustion Motors*.

AUTOMOBILES**Engine Design**

British Designers Aim at Increased Motor Efficiency. Reviews British tendencies as revealed at the Olympia show. Ills. 9500 w. Automobile—Nov. 21, 1912. Serial. 1st part. No. 37721.

See also Fuel, under *Combustion Motors*.

Engine Efficiencies

Automobile Efficiencies. L. V. Ludy. Presents results of tests at Purdue University. Ills. 4500 w. S A E Bul—May, 1913. No. 42476 N.

The Increase of Efficiency. Eric W. Walford. An illustrated article indicating how power is wasted, why an engine does not always develop its full power, and how very high power can be obtained from engines. 6000 w. Autocar—April 26, 1913. No. 41912 A.

Engines

The Effect of the Relation of Stroke and Bore in Automobile Engines. John Wilkinson. A detailed study with conclusions. 4000 w. S A E Bul—Dec., 1912. No. 39302 N.

Location of Gasoline Engine Troubles Made Easy. Gives tables compiled by Victor W. Page, showing in a simple manner the various troubles interfering with efficient operation of all types of four-cycle interval-combustion motors. Ills. 1500 w. Sci Am—Jan. 11, 1913. No. 39102.

Grapho-Dynamic Experiments on a Four-Cylinder Motor with Variable Stroke (Graphodynamische Untersuchung einer vierzylindrigen Fahrzeugmaschine mit veränderlichem Hub). A. Nerretter. Tests and description of the motor built by Gill and Aveling, England. Ills. Serial. 1st part. 2800 w. Motorwagen—Dec. 20, 1912. No. 39021 D.

Church Pneumatic Transmission Unit Power Plant. Illustrated description of a unit power plant of interest, shown at Chicago. 2000 w. Horseless Age—Feb. 19, 1913. No. 39967.

French Kerosene Motor for Automobiles. Illustrated detailed description of the new Bellem oil motor, which runs on kerosene oil or crude oil, and can be started while the engine is cold. Uses no carburetor nor compressed air. 1500 w. Automobile—March 20, 1913. No. 40750.

Kerosene Engines. John A. Secor. Discusses the supply and demand of gasoline, methods of increasing the supply, alternative fuels, kerosene and gasoline engines, oil-engine types and their commercial efficiency, etc. General discussion. 7500 w. S A E Bul—March, 1913. No. 41260 N.

Engines

Consult Classification of the Index. See page 9.

Engine Testing

AUTOMOBILES

Exhibitions

Magic Motor. F. R. Hutton and Herbert Chase. A certified test by the Technical Committee of the Automobile Club of America of motor manufactured by Fischer Wagon Co. Discussion. 3500 w. S A E Bul—March, 1913. No. 41262 N.

New Waukesha Motors. Drawings and description of two new models of automobile and truck motors, both of the four-cylinder type. 1000 w. Horseless Age—April 2, 1913. No. 41052.

Non-Poppet Motors Influence Poppet Types. E. P. Batzell. The advantages claimed by each type are discussed. Ills. 2500 w. Automobile—April 3, 1913. Serial. 1st part. No. 41059.

Possibilities of Six-cylinder, Three-throw, V Engines. Archibald Sharp. A critical discussion. 1200 w. Autocar—May 10, 1913. No. 42273 A.

Lightweight Reciprocating Parts for Motors. Morris R. Machol. Discusses the problem of reducing the weight of the reciprocating parts of the gasoline engine and the effect. 5000 w. S A E Bul—April, 1913. No. 42337 N.

The Eight-cylinder V Engine. W. G. Aston. Points out the advantage of the 8-cylinder system. Ills. 2500 w. Autocar—May 3, 1913. No. 41993 A.

Two-Cycle Motors (Zweitaktmotoren). Herr Praetorius. A general review of design, setting forth its favorable and unfavorable points in comparison with four-cycle engines. Ills. Serial. 1st part. 2500 w. Motorwagen—April 20, 1913. No. 42135 D.

Engines in Sections. An illustrated article for those who do not know how engines work. 1000 w. Auto Jour—June 14, 1913. No. 43126 A.

See also same heading, under *Combustion Motors*.

Engine Testing

Automobile Engine Testing by Electric Motors. A. G. Chapin. Describes methods of testing and the equipment used. 1600 w. Elec Jour—Nov., 1912. No. 37889.

Test of a Daimler Sleeve Valve Engine. W. Walson, H. Schofield, and J. Wilson. Describes the engine and reports the test and results. Ills. 5000 w. Autocar—Nov. 9, 1912. No. 37629 A.

Motor Testing Plants. J. Edward Schipper. Illustrated description of apparatus for accurate testing purposes. 3000 w. Automobile—March 13, 1913. No. 40627.

Automobile Engine and Carburetor Testing. Herbert Chase. Outlines methods followed, briefly describing apparatus used and results obtained. Ills. 4500 w. S A E Bul—Feb., 1913. No. 40395 N.

Engine Testing at the Northway Plant. J. O. H. Heinze. Explains what this company is doing in the way of testing motors. Ills. 4000 w. Automobile—April 10, 1913. No. 41182.

Factory Methods of Testing Automobile Motors. Stanley Petman. Illustrated description of how the testing stand or block is used. 1500 w. Sci Am. March 29, 1913. No. 40961.

First Report of Motor Testing Division. J. O. Heinze. Gives plans, diagrammatic views of apparatus, and methods pursued in making tests. 2800 w. S A E Bul—March, 1913. No. 41261 N.

English Subsidy

English War Department Subsidy Scheme, 1912 Specifications for Petrol Lorries. Explains the general conditions governing the grant of subsidy to vehicles suitable for war department purposes. Ills. 5000 w. S A E Bul—April, 1913. No. 42334 N.

Equipment

The Equipment of the Car. Refers particularly to foreign practice when the purchaser of a car specifies its final equipment. Reviews details. 3000 w. Auto Jour—June 14, 1913. No. 43125 A.

Exhaust

Exhaust Gas Analysis. Engineers discuss the value of analyzing exhaust gases to determine engine and carburetor efficiency. 3500 w. Automobile—Feb. 6, 1913. Serial, 1st part. No. 39678 C.

Exhibitions

International Motor Exhibition at Olympia. Illustrated description of interesting exhibits showing the general tendency of modern motor construction. Plate. 5000 w. Engng—Nov. 15, 1912. No. 37823 A.

Motor Car Show at Olympia. General review, with illustrated description of exhibits. 2500 w. Engr, Lond—Nov. 8, 1912. Serial. 1st part. No. 37648 A.

The French Motor Show. Notes and criticisms on the exhibits in Paris. 8000 w. Autocar—Dec. 14, 1912. No. 38384 A.

The Electrical Exhibits at the Olympia Motor Car Exhibition. Charles J. Webb. Illustrates and describes electrical specialties in connection with automobiles. Magnetos, sparking plugs and other ignition accessories, electric lamps, electric horns, etc. 1600 w. Elec Rev, Lond—Nov. 22, 1912. Serial. 1st part. No. 38021 A.

Automobile America at the Shows. Illustrates and briefly describes the exhibits at Madison Sq. Garden and Grand Central Palace, New York, in January. 5500 w. Automobile—Jan. 16, 1913. No. 39210.

Consult Classification of the Index. See page 9.

Exhibitions

The Progress in Automobilmism in 1912 (Les Progrès de l'Automobilisme en 1912). F. Drouin. A study of improved motor design as exhibited in the Paris Salon. Ills. Serial. 1st part. 3700 w. Genie Civil—Jan. 4, 1913. No. 39089 D.

The New York Motor Show. A critical review by an English automobile engineer resident in America. Ills. 3500 w. Autocar—Feb. 1, 1913. No. 39767 A.

Mechanical Features of Pleasure Cars at the National Shows. A. C. Woodbury. Illustrated review of features of interest, and also a table of statistics. 4000 w. Horseless Age—Jan. 29, 1913. No. 39572 C.

Truck Springs, Suspensions, and Details at the Shows. Asher Golden. Drawings and descriptions showing tendencies in design. 3000 w. Horseless Age—Jan. 29, 1913. No. 39574 C.

Business Cars at Olympia. Calls attention to points of interest at the Industrial Motor Vehicle Show. Ills. 3000 w. Autocar—July 26, 1913. No. 44160 A.

Commercial Motor Vehicle Exhibition. Illustrates and describes the exhibits at Olympia. 5000 w. Engr, Lond—July 25, 1913. No. 44189 A.

The Commercial Motor Vehicle Exhibition. An account of the exhibition at Olympia, illustrating and describing the interesting exhibits. 7500 w. Engng—July 25, 1913. Serial, 1st part. No. 44182 A.

See also Commercial Vehicles, and Motor Plows, under *Automobiles*.

Fiat

Manufacturing Fiat Motor Cars. Ethan Viall. Illustrates and describes methods of work in the American branch of this Italian factory. 2000 w. Am Mach—Nov. 21, 1912. No. 37662.

Four-cylinder Model Added to Fiat Line. Illustrates and describes models for the next season. 2200 w. Automobile—Dec. 5, 1912. No. 38085.

Fiat Rear Axle and Torque Tube a Unit. Illustrates and describes factory processes in construction and assembly of combined rear axle and torque tube stampings. 1500 w. Automobile—Dec. 12, 1912. No. 38171.

Fire Apparatus

The Motor Fire Apparatus Situation Analyzed. Albert L. Clough. Discusses comparative costs of horse and motor maintenance, advantages, etc. 2000 w. Horseless Age—March 26, 1913. No. 40933.

American Fire Trucks (Amerikanische Feuerwehrautomobile). Herr Hüpeden.

AUTOMOBILES

Franklin

Illustrated descriptions of some leading designs. 5000 w. Zeit d Mitt Motorwagen Ver—March 15, 1913. No. 41451 D.

German Automobile Fire Apparatus (Deutsche Feuerwehrautomobile). Erich Blumenthal. Illustrated description of recently built fire engines and ladder trucks. 3000 w. Auto Rundschau—July 30, 1913. No. 44660 D.

Motor Fire Apparatus. H. W. Perry. Presents facts showing how rapidly motor apparatus is replacing horses. Ills. 2500 w. Munic Engng—Sept., 1913. No. 45207 C.

New Bedford's Auto Apparatus. Walter H. York. Illustrates and describes apparatus built by the New Bedford Fire Department. 1800 w. Munic Jour—Sept. 11, 1913. No. 45121.

Care of Motor Driven Fire Apparatus. J. M. Taylor. First prize paper. Illustrated description of the maintenance of motor apparatus, both electric and gasoline driven. 3000 w. Munic Engng—Oct., 1913. No. 46143 C.

Care of Motor Fire Apparatus. F. H. Bemis. 2nd prize paper. Suggestions and directions for keeping apparatus in good condition. 1500 w. Munic Engng—Oct., 1913. No. 46147 C.

See same heading, under *CIVIL ENGINEERING, Municipal*.

Fire Trucks

The New Adler Motor Fire Engine (Die neue Motorspritze der Adlerwerke). W. Schwerdtfeger. Descriptions of hose ladder, engine and firemen trucks built by the Adler Company. Ills. 4000 w. Motorwagen—Jan. 20, 1913. No. 40049 D.

F. N.

The 12-14 h. p. F. N. Illustrated description of this Belgian car and its ingenious lubrication system with reserve supplies of oil. 2000 w. Autocar—May 3, 1913. No. 41994 A.

Ford

A Limousine Body Designed for the Ford. George J. Mercer. Brief illustrated description of a special body that can be fitted without chassis alteration. 1500 w. Automobile—July 17, 1913. No. 43827.

See Service System, under *Automobiles*.

Franklin

Franklin Series Two Reveals a New Little Six. Illustrated description of the Model M. "Little Six" 30 H. P. touring car, and other models of this Syracuse, N. Y., company. 2200 w. Horseless Age—Nov. 6, 1912. No. 37360.

Fuels

Fuels

Gasoline and Its Future. N. B. Pope. Discusses supply and demand, the need of standardization, other fuels, etc. 3000 w. S A E Bul—Dec., 1912. No. 39306 N.

Low-Grade Fuel for Motor Trucks. N. B. Pope. Read before the Soc. of Engrs. Discusses the need of educating the public in the use of low-grade substitutes for gasoline. 2500 w. Automobile—Jan. 23, 1913. No. 39493.

Will the Automobile Be Driven by Kerosene? H. A. Morris. Discusses the problem of the decreasing supply of gasoline and the increasing number of internal combustion engines. Ills. 1700 w. Sci Am—Jan. 11, 1913. No. 39104.

Low-Grade Fuel for Motor Trucks. N. B. Pope. Discusses available fuels and their value, carburetion, combustion, etc. 2200 w. S A E Bul—Jan., 1913. No. 39945 N.

Motor Fuels. W. R. Ormandy. Discusses petrol, paraffin, coal tar products of the benzole class, and alcohol, giving facts and suggestions. 7000 w. Autocar—March 1, 1913. No. 40461 A.

Motor Spirit to Solve Fuel Problem for the Passenger Car. Information concerning this substitute for gasoline as a fuel. 2000 w. Automobile—Feb. 27, 1913. No. 40233.

Synthetic Petrol. A discussion of the fuel problem. 2500 w. Auto Jour—March 8, 1913. Serial. 1st part. No. 40700 A.

Gasoline and Its Future. N. B. Pope. The consumption and production and probability of shortage are discussed; fuel standardization, substitutes, etc. 3300 w. S A E Bul—Feb., 1913. No. 40393 N.

Gasoline and Its Substitutes. Discusses the probability of substituting a less expensive fuel for gasoline, methods of producing gasoline, etc. 2000 w. Sci Am—March 22, 1913. No. 40748.

The Waning Supply of Gasoline. John A. Secor. Extracts from an address before the Soc. of Auto. Engrs., Indianapolis. 2500 w. Sci Am Sup—April 26, 1913. No. 41618.

The Physical Properties of Gasoline and Kerosene. Based on an article by L. Berger. Considers the properties of the two fuels. 2000 w. Horseless Age—April 23, 1913. No. 41612.

The Use of Gasoline-Kerosene Mixtures. Albert L. Clough. Suggestions for the use of this mixture. 1200 w. Horseless Age—April 23, 1913. No. 41610.

Motor Fuels. W. R. Ormandy. Information is given of the writer's experience with benzole and mixtures, and an

AUTOMOBILES

Fuels

account of experimental work to be undertaken. 4000 w. Autocar—March 22, 1913. No. 40997 A.

The Del Monte Process. W. R. Ormandy. Information concerning this process for furnishing an economical motor-spirit; a smokeless fuel; and the claims made. 2500 w. Autocar—April 12, 1913. No. 41373 A.

Liquid Motor Fuels. A. E. Potter. Remarks on alcohol and the hydrocarbons. 2000 w. S A E Bul—April, 1913. No. 42338 N.

Motor Fuels. Harry Tipper. A discussion of crude oils, kerosene, gasoline, etc., with general discussion. 4500 w. S A E Bul—April, 1913. No. 42339 N.

Notes on Paraffin. Eric W. Walford. Illustrates and describes details of the White and Poppe system, and of the Halliday paraffin carbureter. 2500 w. Autocar—April 19, 1913. No. 41747 A.

An Examination of the Characteristic Flow of Fuel Through a Small Orifice. R. M. Anderson. Brief account of experiments to determine the relation of flow to head. 800 w. Soc of Auto Engrs—June, 1913. No. 43298 N.

Fuel for Combustion Motors, Its Occurrence and Thermodynamic Changes (Brennstoffe für Explosionsmotoren, ihr Vorkommen und ihr thermodynamisches Verhalten). August Bauschlicher. A review covering the known oil-fields, the distillation and sale of gasoline, the combustible power of gasoline, etc. 8000 w. Motorwagen—April 30, 1913. No. 43026 D.

Observations on the Benzol Question, with Particular Reference to Carburetors (Betrachtungen zur Benzolfrage mit besonderer Berücksichtigung der Spritzvergaser). Karl Büchner. A chemical study of this oil and the type of carburetor most suitable for its use. Ills. Serial. 1st part. 10000 w. Zeit des Mitt Motor Ver—Apr. 30, 1913. No. 43030 D.

The Fuel Problem for Automobiles and Small Agricultural and Industrial Motors (Le problème de carburant pour les moteurs d'automobiles et les petits moteurs agricoles ou industriels). A. Grebel. A study by charts showing the increasing demand for fuel and the constant decrease in proportionate supply. Serial. 1st part. 4800 w. Génie Civil—June 14, 1913. No. 43090 D.

Fuel for Motor Vehicles. Abstract of paper on "Petrol Substitutes," read at the Imperial Motor Transport Conference. Sir Boverton Redwood and Vivian B. Lewes. Discusses the likely sources from which a substitute for petrol might be derived. 2500 w. Col Guard—July 25, 1913. No. 44179 A.

Consult Classification of the Index. See page 9.

Fuel Tanks

Sources of Motor Fuel. Reviews the technical side of the problem with reference to the papers read at the Imperial Motor Transport Conference. 3000 w. Engng—July 25, 1913. No. 44183 A.

Benzol and Its Field in the Driving of Power Wagons (Das Benzol und seine Verwendung für den Betrieb von Kraftfahrzeugen). Ernst Jaenichen. The characteristics of this fuel and a suitable type of carburetor. Ills. 3600 w. Auto Rundschau—June 30, 1913. No. 44659 D.

Solving the Fuel Problem for the Motor Truck. Harold Whiting Slauson. Discusses the characteristics of kerosene as a fuel for internal combustion engines. Ills. 3500 w. Mach, N Y—Oct., 1913. No. 45609 C.

The Fuel Question. J. S. Critchley. Condensed presidential address before the Inst. of Auto, Engrs., London. A discussion of the motor fuel problem. 6000 w. Horseless Age—Oct. 22, 1913. Serial, 1st part. No. 46193.

See also Carburetors, Economy, and Engines, under *Automobiles*.

Fuel Tanks

Rear Fuel Tanks and Their Supporting Means. Illustrates and describes new ideas in tank supports shown at the Chicago exhibition. 1700 w. Horseless Age—Feb. 5, 1913. No. 39730.

Garages

Concrete Service Depot for Automobiles. Describes details of a building in Boston. Ills. 2000 w. Eng Rec—Nov. 16, 1912. No. 37583.

Electricity for Garages. Information and data showing the durability of the battery charging load, and describing details. Ills. 4000 w. Elec Rev & W Elect'n—May 3, 1913. No. 41871.

The Bangor Motor Co.'s New Garage, Bangor, Me. Illustrated detailed description. 1200 w. Horseless Age—May 7, 1913. No. 41984 C.

The Dupont Garage, Washington, D. C. Illustrated detailed description of a garage designed for high-class service. 4000 w. Horseless Age—May 7, 1913. No. 41981 C.

Georgian Service Garage, Atlanta, Ga. Illustrated detailed description of the building and service. 2000 w. Horseless Age—May 7, 1913. No. 41983 C.

The Mulkern Garage, Milwaukee, Wis. Illustrated description of the building, its arrangement and management. 3500 w. Horseless Age—May 7, 1913. No. 41986 C.

The Nickerson Garage, Portland, Me. Illustrated description of one of the largest and best garages in New England. 2500 w. Horseless Age—May 7, 1913. No. 41985 C.

AUTOMOBILES

Grant

Portable Garage Is a Problem Solver. Sydney Oxberry. Illustrated description of garages that can be easily erected by the owner. 3000 w. Automobile—June 19, 1913. No. 42966.

Garage Economy Depends on Its Layout. Calls attention to the effect of arrangement on the convenience and celerity in handling cars. 1500 w. Automobile—Sept. 11, 1913. No. 45107.

Gasoline Pumps

Sidewalk Gasoline Pumps Draw Transient Trade. Illustrates and describes types of pumps for curb selling of gasoline. 2500 w. Automobile—Oct. 9, 1913. No. 45790.

Gear Changing

Gear Changing and the Clutch Brake. E. P. Batzell. Claims that silent changing is rendered easier by clutch brake which permits control of gear before meshing. 2500 w. Automobile—March 27, 1913. No. 40884.

Gear Ratios

How to Choose in Case of an Option on Gear Ratio. Albert L. Clough. Suggestions helpful in selecting the gear ratio of the final drive. 1200 w. Horseless Age—April 2, 1913. No. 41051.

Gears

The Desirable Number of Gear Changes. P. S. Tice. Explains why a change gear is necessary and the limitations of the internal combustion engine, showing how to determine the desirable number of gear changes for any car. 3500 w. S A E Bul—July, 1913. No. 44331 N.

History of the Double Direct Drive. A. C. Woodbury. Illustrated review of cars equipped with direct drives. 1500 w. Horseless Age—Aug. 20, 1913. No. 44533.

See same heading under *Machine Elements and Design*.

Germany

Automobile Statistics for the German Empire (Automobil-Statistik des Deutschen Reiches). Diagrams showing the increase in the number of cars in use since 1907 in the several provinces. Serial, 1st part. 2000 w. Motorwagen—May 31, 1913. No. 43029 D.

Globe

The 8-H.P. Globe Car. Illustrated description of a modern light car with an ingenious combination of belt and chain drive. 1500 w. Auto Jour—March 8, 1913. No. 40699 A.

Grant

New Grant Car a Real Miniature Automobile. Brief illustrated description of this new small car, having 4 cylinder motor, cone clutch, and regular shaft drive.

Hampton

1200 w. Automobile—June 27, 1913. No. 43242.

Hampton

The 11.9-H.P. Hampton Car. Illustrated description of a new British-built light car. 1000 w. Auto Jour—Jan. 11, 1913. No. 39244 A.

Havers

Havers Adds a Big Six. Illustrated detailed description of a new model. 2500 w. Automobile—Dec. 26, 1912. No. 38582.

Head Lights

Autocar Head Lights. D. H. Ogley. A series of three elementary monographs dealing with the theory and practice of acetylene and electric head lamp design. 2000 w. Autocar—Nov. 23, 1912. Serial. 1st part. No. 38019 A.

Horsepower

The Measurement of Horsepower. W. Morgan and E. B. Wood. Discusses methods of measurement and gives a report of experiments to determine reliability and limitations. Ills. 3000 w. S A E Bul—July, 1913. No. 44329 N.

Hotchkiss

The 20-30-H.P. Hotchkiss Car. Illustrated description. 2000 w. Auto Jour—March 15, 1913. No. 40803 A.

Howard

New Howard Car. Illustrated description of the Howard Six, a new six-cylinder car. 2000 w. Horseless Age—March 5, 1913. No. 40362.

Hupmobile

The 15-18 h. p. Hupmobile. Describes the interesting unit construction of engine, clutch, pit, and gear box, and other features. Ills. 1200 w. Autocar—June 14, 1913. No. 43127 A.

Hydraulic Drive

The Hele-Shaw Hydraulic Transmission for Motor Cars (Motorwagen mit hydraulischer kraftübertragung System Hele Shaw). Herr Wittmaack. Describes the main features of this system for replacing clutch, gear-box and differential in motor vehicles. Ills. 1700 w. Zeit des Mitt Motor Vereins—Dec. 30, 1912. No. 39028 D.

See also Gears, under *Machine Elements and Design*.

Hydraulic Transmission

A New Variable Speed Hydraulic Power Transmission Device Applied to a Motor Truck. Illustrated description of the gear and its application. 2000 w. Eng News—Oct. 31, 1912. No. 37208.

See same heading under *Hydraulic Machinery, and Gears under Machine Elements and Design*.

Ignition

How the Magneto Works. Eric W. Walford. An illustrated colloquial ex-

AUTOMOBILES

La Buire

planation for beginners. 5000 w. Autocar—Nov. 2, 1912. Serial. 1st part. No. 37387 A.

The Magneto and the Spark Coil. Joseph B. Baker. Explains how the magneto and spark coil work in igniting the mixture in an internal combustion engine. Ills. 2500 w. Power—Nov. 12, 1912. No. 37375.

Automatic Spark Advance. S. M. Udale. Discusses spark advance and problems related. 800 w. Horseless Age—Dec. 11, 1912. No. 38170.

Battery versus Magneto Ignition Systems. Benjamin Bailey. Considers the constant voltage ignition possible with a good battery system to be superior to magneto ignition. Ills. 4000 w. Automobile—Aug. 28, 1913. No. 44799.

Automatic Control of Firing Time. Albert L. Clough. Discusses the effect of spark governors on engine behavior and fuel economy. 2000 w. Horseless Age—Aug. 20, 1913. No. 44534.

See same heading, under *Combustion Motors*.

Imperial

Three Imperial Models on the Market. Illustrated description of Model 44, as the general specifications apply to all. 2500 w. Horseless Age—Nov. 20, 1912. No. 37768.

Inspection

General Inspection Methods. E. F. Roberts. Read before the Soc. of Auto. Engrs. Discusses details of thorough inspection. 6000 w. Horseless Age—June 25, 1913. No. 43192.

General Inspection Methods. E. F. Roberts. Discusses its importance with special reference to automobile manufacture. 5000 w. S A E Bul—July, 1913. No. 44330 N.

Italy

The Automobile Industry in Italy (L'industria dell'automobile in Italia). Ranieri Pini. A review of exports and imports since 1907, showing increase in number and value. 1200 w. Industria—Aug. 24, 1913. No. 45366 D.

Keeton

Some Features of the Keeton Six "48." Illustrates and describes features of this six-cylinder car. 2500 w. Horseless Age—April 30, 1913. No. 41827.

Kisselkar

Kisselkar Models for 1913. Illustrations and brief description of four cylinder chassis models of 30, 40, and 50 h. p., and a six cylinder chassis of 60 h. p. 800 w. Horseless Age—Oct. 30, 1912. No. 37201.

La Buire

The 20 h. p. La Buire. Illustrated de-

Lighting

tailed description of an interesting French car. 1500 w. Autocar—April 19, 1913. No. 41749 A.

Lighting

Some Points in Electric Lighting for Automobiles. C. F. Kettering. Considers the method of control, the candle power, the tungsten filament, etc. 2500 w. S A E Bul—Oct., 1912. No. 37175 N.

Ward Leonard Electric Lighting System. Illustrated description of this automatic dynamo lighting system. 1600 w. Automobile—Dec. 12, 1912. No. 38173.

Electric Light at Low Cost. A. C. Woodbury. Recommends and describes details of a multiple series connection of dry cells for cars when used but seldom at night. 2500 w. Horseless Age—Jan. 1, 1913. No. 38789.

Electric Cranking and Lighting. Reviews the requirements of a complete electric system, with introductory to a discussion of each system. Ills. 3300 w. Automobile—Jan. 16, 1913. Serial. 1st part. No. 39211.

The Rushmore Electric Car Lighting System. Illustrated detailed description. 1500 w. Horseless Age—Jan. 1, 1913. No. 38790.

Electric Lighting of Gasoline Car. Illustrates and describes the two methods of control in use, and other details. 3000 W. Automobile—Feb. 6, 1913. No. 39679 C.

Electric Lighting System at the Recent Show. A. C. Woodbury. Illustrates and describes the different electric systems for lighting automobiles. 3000 w. Horseless Age—Jan. 29, 1913. No. 39571 C.

Recent Ideas in Magneto Electric Lighting Devices (Neuere Vorschläge für magnetelektrische Zündmaschine). W. Wolf. A review of late designs. Ills. 1st part. 2000 w. Motorwagen—March 10, 1913. No. 41444 D.

The E. B. C. Dynamo Lighting Set. Illustrated detailed description. 1200 w. Auto Jour—July 26, 1913. No. 44159 A.

Electric Automobile Lighting (Die elektrische Automobilbeleuchtung). Josef Löwy. Principles of dynamo construction, wiring systems, lamps and reflectors. Ills. 4000 w. Elek u Masch—July 27, 1913. No. 44693 D.

See also Head Lights, Electric Systems and Motorcycles, under Automobiles and Motorcycles.

Little

The "Little" Car. Illustrated detailed description of an American low-priced car of unusual excellence. 1500 w. Auto Jour—Jan. 25, 1913. No. 39769 A.

Locomobile

Locomobile Little Six Introduced for

AUTOMOBILES

1913. Illustrates and describes refinements introduced in the latest models. 3500 w. Automobile—Dec. 12, 1912. No. 38172.

London

The London Motor Omnibus Service. T. B. Browne. Read before the Soc. of Auto. Engrs. Describes types of vehicles and gives latest regulations as regards weight limits, and other information. Ills. 3000 w. Horseless Age—June 11, 1913. No. 42811.

Lozier

The Lozier Light-Six. Illustrated detailed Description of Type 77. 2000 w. Automobile—April 3, 1913. No. 41060.

The Lozier Light "Six." Illustrates and describes the new features introduced in the latest model. 2200 w. Horseless Age—May 21, 1913. No. 42392.

Lubrication

A Chapter on Friction and Lubrication (Ein Kapitel über Reibung und Schmiermittel). Kurt Bilau. Studies on the coefficient of friction in bearings, showing loss of available power. 3000 w. Zeit d Mitt Motorwagen Ver—March 15, 1913. No. 41452 D.

Gearbox Lubrication. Albert L. Clough. Suggestions for the proper lubrication of gear sets. 1500 w. Horseless Age—July 2, 1913. No. 43439.

See same heading, under Combustion Motors.

Magneto

See Ignition, under Automobiles.

Mail Services

Automobile Mail Services. From a paper by G. Hamilton Grapes, read in London. Reviews the application of motor wagons for mail haulage in different countries, with observations on the most suitable type of vehicle for the purpose. 2000 w. Horseless Age—Aug. 20, 1913. No. 44532.

Materials

Materials for Motor-Bus Construction. Gives specifications to which the Daimler Company work. Ills. 2500 w. Engng—Jan. 17, 1913. No. 39481 A.

Fourth Report of Iron and Steel Division. Revised notes and instructions referring to materials specified. 7000 w. S A E Bul—May, 1913. No. 42469 N.

The Manufacture of Motor Car Parts in America. James McIntosh. Explains how special methods and even skill in special work make possible the cheap cars built, and not poor materials. 3300 w. Engr, Lond—May 9, 1913. No. 42294 A.

Construction Material of the English Daimler Omnibus (Baustoffe der englischen Daimler-Omnibuses). Micro-

Materials

Maxwell

graphic studies of the metals entering into the construction. Ills. 2600 w. Auto Rund—Sept. 30, 1913. No. 46058 D.

Maxwell

The Maxwell Twenty-five. Illustrated description of this four cylinder 25 h. p. touring car. 2000 w. Horseless Age—May 28, 1913. No. 42629.

Maxwell 35-4 Touring Car. Illustrated detailed description of this new model. 700 w. Horseless Age—Aug. 6, 1913. No. 44230.

Michigan

Four Michigan Models for 1913. Illustrates and describes interesting features of new models. 2200 w. Horseless Age—Dec. 4, 1912. No. 38053.

Military

The Program for the 1913 Endurance Tests for Military Trucks (Le Programme de l'Epreuve d'Endurance des Camions Militaires pour 1913). D. Duaner. An outline of the conditions to be covered in this test. 4500 w. Genie Civil—Nov. 2, 1912. No. 37521 D.

Endurance Tests of Military Trucks of the 1913 Models from October 2 to 30, 1912. (Prüfungsfahrt der Armeelastzüge neuer Art, Typ 1913, vom 2. bis 30. Oktober, 1912). Herr Listemann. Describes the various entrants, and results of test. Ills. 5000 w. Motorwagen—Nov. 20, 1912. No. 38441 D.

Endurance Test of the New Military Trucks (Die Prüfungsfahrt der neuen Armeelastzüge). Describes some of the trucks and the conditions of the test from the 2nd to the 30th of October. Ills. 2700 w. Zeit d Mitt Motor Vereins—Dec. 15, 1912. No. 39020 D.

Relief Motor Trucks for Austrian Army Service (Die Subventions-Motorlastwagen der österreichischen Heeresverwaltung). A. Heller. Detailed description of the design of these heavy-duty trucks. Ills. 3800 w. Zeit des Ver deutscher Ing—Dec. 28, 1912. No. 39043 D.

Trials of Military Tractors with Four-Wheel Drive (Concours de tracteurs militaires à quatre roues motrices). D. Duaner. The trucks entering the competition, their application of the four-wheel drive, test conditions and results. Ills. 5000 w. Genie Civil—April 12, 1913. No. 41528 D.

A Practice Run of the Bavarian Automobile Troop (Eine Übung der bayerischen Kraftfahrtruppen). Fritz Listemann. Details of a military test of ten army trucks and four passenger cars on a seven-day run, with comparative results of fuel and oil consumed, and other de-

AUTOMOBILES

tails. Ills. 3000 w. Motorwagen—Apr. 30, 1913. No. 43025 D.

Standardization of Army Motor Trucks in Germany (Einbürgerung des Lastkraftwagenbetriebes im Deutschen Reiche). Specifications and approved designs as adopted by the German War Department. Ills. Serial. 1st part. 6000 w. Motorwagen—May 10, 1913. No. 43027 D.

70 Trucks Compete in French Army Trials. Illustrated account of the annual competitive trials. 2500 w. Automobile—July 24, 1913. No. 43866.

Automobile Troops in Field Action (Kraftfahrtruppen im Felde). An outline of the composing elements of an automobile troop, its government and scope. Ills. 6300 w. Auto Rundschau—Aug. 15, 1913. No. 44662 D.

Three-Ton War Office Subsidy Chassis. Illustrated description of a commercial chassis designed to meet the requirements of the War Office subsidy scheme. 800 w. Engng—Aug. 22, 1913. No. 44918 A.

Military Endurance Tests of Heavy Trucks (L'épreuve d'endurance militaire des véhicules de poids lourd). D. Duaner. List of entries and result of tests during the period July 1 to Aug. 12. Ills. Serial, 1st part. 3500 w. Genie Civil—Aug. 23, 1913. No. 45354 D.

Motorizing Mars in France. Report of tests showing the superiority of motor trucks to horses under conditions of war. 2000 w. Automobile—Oct. 9, 1913. No. 45789.

Morris-Oxford

The Morris-Oxford Light Car. Illustrated description of a well-designed small car, with four cylinders, unit system, multiple disc clutch and worm drive. 1500 w. Autocar—April 19, 1913. No. 41748 A.

Motor Cycles

Motor Cycles at Olympia. Illustrates and describes interesting details. 3500 w. Auto Jour—Dec. 7, 1912. No. 38230 A.

The Genealogy of the Motorcycle. J. J. O'Connor. Reviews the development from the steam velocipede, 1868, to the standard machine of 1913. Ills. 2000 w. Sci Am—July 5, 1913. No. 43429.

Electric versus Gas Lighting for Motorcycles. L. C. Porter. Reports tests made by the author, showing the general advantages of electric lighting and giving results of road tests and laboratory tests. Ills. 3000 w. Gen Elec Rev—Aug., 1913. No. 44090 C.

Motor Plows

The Lanz Agricultural Motor, Köszege-Seck System (Landbau-Motor Lanz System Köszege-Seck). Introduces new type

Consult Classification of the Index. See page 9.

Motor Plows

of motor plow, acting both as plow and harrow. Ills. 2000 w. Zeit des Mitt Motorwagen Ver—Nov. 30, 1912. No. 38444 D.

The Third Motor Plow Exhibition at Winnipeg (Die dritte Motorpflugkonkurrenz in Winnipeg). K. v. Meyenburg. Discusses the several agricultural motors on exhibit. 2800 w. Motorwagen—Nov. 20, 1912. No. 38442 D.

Problems in Experimental Motor-Plow Mechanics (Probleme einer experimentellen Motorpflugmechanik). R. Bernstein. Experiments on driving power, soil resistance, etc. Ills. Serial. 1st part. 7500 w. Motorwagen—March 31, 1913. No. 41447 D.

Recent Motor Plows (Neuere motorpflüge). K. Praetorius. Review of some of the latest inventions in Europe. Ills. Serial. 1st part. 3200 w. Zeit d mitt Motorwagen Ver—March 1, 1913. No. 41450 D.

Discussion on Motor Plows in the Automobile Industries (Diskussion über Motorpflüge in der Automobiltechnischen Gesellschaft). Discussion on the paper by Prof. Martiny by the engineers of leading automobile companies of Germany. 15000 w. Motorwagen—Sept. 10, 1913. No. 46052 D.

Motors

Light Motors Show Efficiency and Power. E. H. Delling. Considers that high speed motors developed in recent years show low weight per horsepower. 3000 w. Automobile—Oct. 16, 1913. No. 45901.

Motor Truck Design

Tendency of Foreign Motor Truck Design. L. C. Freeman. Read before the Soc. of Auto. Engrs., N. Y. Reviews some details of design, commenting on their advantages and disadvantages. 2000 w. Horseless Age—Feb. 12, 1913. No. 39855.

Motor Trucks

The Building of Hewitt Motor Trucks. Robert Mawson. Illustrated description of special tools that effect a saving of time on crank case machinery. 1800 w. Am Mach—Nov. 7, 1912. No. 37297.

Motor Transportation as an Aid to Industrial Economy. Rollin W. Hutchinson, Jr. Third and concluding article of a study. Gives comprehensive data of actual haulage costs. Ills. 3000 w. Engineering Magazine, March, 1913. No. 40082 B.

Efficiency of Motor Trucks with Trailers. Morgan Cilley. Reports a series of tests made under various conditions at Troy, Ohio. Ills. 4000 w. Eng Rec—Feb. 1, 1913. No. 39645.

Tests of Efficiency of Motor Trucks

AUTOMOBILES

with Trailers. Description and summary of tests made by Richard T. Dana. 4000 w. Engng & Con—Feb. 19, 1913. No. 39932.

Motor Sizes for Motor Trucks. Cornelius T. Myers. Discusses items in motor size selection, tractive factors in America and in France, etc. 3000 w. S A E Bul—Jan., 1912. No. 39944 N.

Some Features of the 1913 Motor Truck Show in New York City. Illustrated description of interesting exhibits. 2000 w. Eng News—Feb. 20, 1913. No. 39975.

Studebaker 3-Ton Truck. Illustrates and describes details. 1100 w. Horseless Age—Feb. 5, 1913. No. 39732.

Economics of Motor Trucking. Clinton Brettell. Compares gasoline and electric motor trucks with those drawn by horses, as to speed, convenience, reliability, and cost of operation. Ills. 4500 w. Sch of Mines Qr—April, 1913. No. 41696 D.

End Dump Bodies for Commercial Vehicles. Ross Babcock. Illustrates and describes types of dumping bodies. 1800 w. Sci Am—April 26, 1913. No. 41592.

Present Status of Motor Truck Practice with Special Reference to H. Büssing-Braunschweig Designs (Der heutige Stand des Lastkraftfahrwesens unter besonderer Berücksichtigung der Konstruktionen von H. Büssing-Braunschweig). Dr. Hofmann. Testing details of these trucks for heavy service. Ills. 4000 w. Zeit d mitt Motorwagen Ver—Feb. 28, 1913. No. 41448 D.

Transmission Systems for Motor Trucks. A. C. Woodbury. A discussion of the relative advantages and disadvantages of different change gear systems and of rear drives. 6000 w. Horseless Age—July 16, 1913. No. 43749.

Increasing the Efficiency of Trucks. Hans W. Weyss. Improvements in operation which reduce the ton-mile cost. 2500 w. Automobile—July 10, 1913. No. 43605.

Motor Trucks in Municipal Contracting. H. W. Perry. Illustrates and describes trucks used on the Catskill Aqueduct, and for other kinds of municipal work. 2000 w. Munic Engrg—July, 1913. No. 44037 C.

N. Y. Edison Co.'s Truck Operating System. Shows how all important information relating to operation can be recorded by use of a few forms. 1200 w. Automobile—July 17, 1913. Serial, 1st part. No. 43828.

Motor Trucks with Four-Wheel Drive (Motorwagen mit Vierräderantrieb). A. Heller. Advantages for heavy loads and details of engine connections. Ills. 2700

Motor Trucks

Motor Trucks

w. Zeit des Ver deutscher Ing—June 7, 1913. No. 43525 D.

Motor Trucks in Municipal Contracting. H. W. Perry. Considers cost per ton-mile, the only logical basis on which to compare the motor with the horse. Ills. 1500 w. Munic Engng—Aug., 1913. No. 44392 C.

Motor Truck Adaptability and Its Relation to Operating Efficiency. P. D. Wagoner. Gives the specification of a Mercedes gasoline truck and indicates what it is capable of doing. 2500 w. Gen Elec Rev—Aug., 1913. No. 44088 C.

Motorized Hauling Service. Wellington Walker. The requirements of successful truck operation are discussed. 1200 w. Munic Engng—Aug., 1913. No. 44393 C.

Developments in Design of Commercial Motor Vehicles. Editorial review of the recent exhibition at Olympia. Ills. 4500 w. Engng—Aug. 1, 1913. No. 44320 A.

The Motor Truck in Contracting and Construction Work. Rollin W. Hutchinson, Jr. First of a series of articles. Gives cost data of aqueduct, bridge and subway jobs. Ills. 6000 w. Engineering Magazine—Sept., 1913. No. 44763 B.

The Motor Truck in Contracting and Construction Work. Rollin W. Hutchinson, Jr. This second article of a serial presents advantages of motor truck service in municipal work chiefly. Ills. 3800 w. Engineering Magazine—Oct., 1913. No. 45545 B.

The Motor Truck in Contracting and Construction Work. Rollin W. Hutchinson, Jr. This third part of a series discusses contractor's objections. Ills. 4000 w. Engineering Magazine—Nov., 1913. No. 46307 B.

Across Alaska by Motor Truck. An account of a remarkable expedition. 1500 w. Eng & Min Jour—Oct. 11, 1913. No. 45807.

Availability of Motor Trucks for Mines. Information on the performance of motor trucks in the mining industry. 4000 w. Eng & Min Jour—Oct. 18, 1913. No. 45937.

4½-Ton Petrol Motor Wagon. Illustrated description of a vehicle exhibited at London built to comply with the requirements of the War Office. 700 w. Engr, Lond—Sept. 26, 1913. No. 45745 A.

Screw Threads on Motor Lorries. Memorandum issued by the Sec. of War Office regarding the screw threads which should be used on motor-lorries constructed to meet the requirements of the War Dept. subsidy scheme. 1400 w. Mech Engr—Sept. 26, 1913. No. 45734 A.

AUTOMOBILES

Nazzaro

See also Commercial Vehicles, Electric Vehicles, Fire Trucks, Fuels, Tractors and Hydraulic Transmission, under *Automobiles*.

Motor Vehicles

Motor Transportation as an Aid to Industrial Economy. Rollin W. Hutchinson. Outlines the betterment of transportation and distribution made possible by motor vehicles, and the enormous possible effect on national economy from their use. Ills. 5000 w.—Engineering Magazine—Jan., 1913. No. 38679 B.

Gimbel Brothers' System of Delivery. An account of how 95 freight automobiles are efficiently handled. 3000 w. Automobile—Dec. 5, 1912. No. 38084.

Motor Transportation as an Aid to Industrial Economy. Rollin W. Hutchinson, Jr. This second article of a series gives comparative data of actual haulage costs, showing the saving effected. Ills. 5000 w. Engineering Magazine—Feb., 1913. No. 39429 B.

Storage Battery Industrial Trucks. Adrian D. Stevenson. Explains the usefulness of such vehicles, illustrating types. 1000 w. Elec Wld—Jan. 11, 1913. No. 38999.

The Auto-Truck for Coal Delivery. Frank C. Perkins. Illustrates types and gives results of service. 1200 w. Sci Am Sup—Jan. 11, 1913. No. 39107.

Heavy Motor Vehicles. George W. Watson and D. S. Kennedy. Deals with goods carrying vehicles having a load capacity of three tons and upwards. Considers both steam and petrol vehicles. Ills. 15000 w. Inst of Auto Engrs—March, 1913. No. 43297 N.

See also Commercial Vehicles, under *Automobiles*.

Mud Guards

Second Mud-Guard Competition of the Seine-Oise Automobile Club (11e concours de pare-boue de l'Automobile-Club de Seine-et-Oise). E. Bret. Description of entries and results of this second open competition for the purpose of obtaining some satisfactory device against splashing from the wheels. Ills. 4800 w. Genie Civil—Dec. 14, 1912. No. 39084 D.

Napier

The 30-H.P., Six-Cylinder Napier. Illustrates and describes the interesting features appearing in the latest model. 2000 w. Autocar—April 12, 1913. No. 41374A.

Nazzaro

The 20-30 H. P. Nazzaro Car. Illustrates and describes interesting details. 1500 w. Auto Jour—Dec. 21, 1912. No. 38860 A.

Noise

Noise

The Origin of Noise in the Automobile. O. W. Hall. Explains causes of noisy operation and gives examples of unusual noises. 3000 w. Horseless Age—April 9, 1913. No. 41158.

N. S. U.

The 18-H.P. N. S. U. Car. Illustrated detailed description. 1000 w. Auto Jour—April 5, 1913. No. 41219 A.

Nyberg

Nyberg 1913 Line Includes Two Sixes. Illustrates and describes new models. 1500 w. Horseless Age—Nov. 13, 1912. No. 37587.

Omnibuses

Automobile Omnibus Service in Saxony (Automobil-Omnibus-Linien im Königreich Sachsen). An account of the twelve lines now in service. 4000 w. Zeit d Mitt Motor Vereins—Dec. 15, 1912. No. 39019 D.

Steam Omnibuses. Thomas Clarkson. Describes the National steam 'bus and explains its advantages. 2500 w. Soc of Auto Engrs—June, 1913. No. 43299 N.

Omnibus Service

Results of the Bavarian Motor Post Service for 1911 (Betriebsergebnisse der bayerischen Motorpostlinien 1911). Herr Pflug. Statistics from the numerous omnibus lines operating in Bavaria. Ills. 4500 w. Zeit d Mitt Motorwagen Ver—Nov. 15, 1912. No. 38443 D.

The London Motor Omnibus Service. T. B. Browne. Detailed account of this large and efficient service. Ills. and plates. 3500 w. S A E Bul—July, 1913. No. 44328 N.

Development of Motor Omnibus Transportation in London. From report of E. S. Sharpwell-Smith to the recent Int. Road Cong. A report of remarkable success. 1200 w. Engng & Con—Aug. 27, 1913. No. 44780.

Development of Motor Omnibus Traffic in Austria. Abstract of a report made by Richard Hofer to the recent Int. Road Cong. in regard to the motor transport service. 1800 w. Engng & Con—Aug. 13, 1913. No. 44345.

Indiana Town Adopts Automobile Buses. James M. Hobart. Illustrated description of omnibuses in service at Huntington, Ind. 1800 w. Automobile—Aug. 14, 1913. No. 44364.

Opel

The 5-12-H. P. Opel Car. Illustrated description of a small car shown at Olympia. 1000 w. Auto Jour—Dec. 7, 1912. No. 38229 A.

Overland

The 20-25 h. p. Overland. Illustrates and describes the changes introduced in

AUTOMOBILES

Plows

the 1913 model. 700 w. Autocar—Nov. 9, 1912. No. 37627 A.

One Overland Chassis for 1914. Illustrates and describes the important changes introduced. 1500 w. Automobile—Aug. 14, 1913. No. 44365.

Packard

Full Report of Packard Motor Test. Gives details of the motor performance during 300-hour run. Ills. 2000 w. Automobile—May 22, 1913. No. 42344.

Painting

Painting the Automobile. M. C. Hillick. Considers various methods of painting both wood and steel. 1800 w. Horseless Age—Oct. 22, 1913. No. 46194.

Painting the Metal Body Automobile. M. C. Hillick. Describes the preparation of metal surfaces and full details of the process. 2000 w. Horseless Age—Oct. 8, 1913. No. 45772.

Partin-Palmer

The Partin-Palmer "38." Illustrates and describes the interesting features. 1500 w. Horseless Age—Aug. 6, 1913. No. 44229.

Pearson-Cox

The Pearson-Cox Steam Car. Illustrated detailed description of the engine, generator, burner, etc., of the 1913 model. 3500 w. Autocar—March 29, 1913. No. 41128 A.

Pedals

Fitting the Car to the Driver. Illustrates and describes many pedal adjustments. 2000 w. Automobile—Aug. 7, 1913. No. 44232.

Petrol-Electric

Petrol-Electric Motor Vehicles. J. B. G. Damoiseau. Abstract. Describes the various types of petrol-electric systems in use and considers their advantages and disadvantages in various classes of service. 3500 w. Elect'n, Lond—May 30, 1913. No. 42764 A.

Peugeot

The 14-20 h. p. Peugeot. Illustrated detailed description of an interesting model. 1000 w. Autocar—Jan. 4, 1913. No. 39133 A.

Piccard-Pictet

The 30-40 h. p. Piccard-Pictet Chassis. Illustrates and describes chassis details. 1000 w. Auto Jour—Dec. 28, 1912. No. 38861 A.

Pistons

An Unusual Method of Handling an Automobile Piston. Albert A. Dowd. Describes methods of machining. Ills. 1200 w. Horseless Age—Sept. 17, 1913. No. 45212.

Plows

Mechanical Plows at the Bourges Exposition (Le labourage mécanique à l'exposition de Bourges). H. Pillaud. De-

Consult Classification of the Index. See page 9.

Pope-Hartford

AUTOMOBILES

Silence

scribes various motor plows and harrows exhibited. Ills. 7000 w. Tech Mod—Nov. 1, 1912. No. 37511 D.

Pope-Hartford

Pope-Hartford Introduces a Low-Priced "Forty." Illustrated description of this new model. 1000 w. Horseless Age—Oct. 30, 1912. No. 37200.

Propeller-Shafts

Stability of Automobile Propeller-Shafts. J. M. Thomas. Discusses critical speed, and methods of determining it. 3000 w. S A E Bul—Dec., 1912. No. 39304 N.

Racing Cars

Two European Racing Cars. Chester S. Ricker. Illustrated descriptions of the Isotta-Fraschini and the Peugeot racer. 2500 w. Horseless Age—Oct. 1, 1913. No. 45631.

Radiators

Methods of Supporting Truck Radiators. Illustrates and describes supports to protect truck radiators from injurious effects of road shocks and against injury from frame distortion. 1200 w. Horseless Age—March 12, 1913. No. 40675.

R. C. H.

R. C. H. Cars. Illustrated description of a moderate-priced popular American car. 1500 w. Auto Jour—Jan. 4, 1913. No. 39134 A.

The 15.9 R. C. H. Car. Brief illustrated description. 1000 w. Autocar—March 8, 1913. No. 40698 A.

Repairs

Motor-Car Repairs; Brakes and Adjustments. J. T. Corner. Gives hints for the inexperienced. Ills. 1500 w. Mech Wld—Dec. 27, 1912. No. 38886 A.

Rims

Standardized Tire Rims. Drawings showing suitably dimensioned tire rims of the principal tire manufacturers. Auto Jour—July 12, 1913. No. 43890 A.

Road Resistance

Some Conditions Affecting the Interaction of Motor Vehicle Wheels on Road Surface. L. I. Hewes. Read before the Am. Assn. for the Adv. of Science. Discusses certain sources of road resistance to the motor vehicle equipped with tires of approximately circular cross section. 1800 w. Engng & Con—Feb. 26, 1913. No. 40227.

Road Tests

Road Tests for Automobiles. William D. Ennis. Report of tests made at Brighton Beach truck to determine the variation in road resistance, air resistance, transmission loss and fuel consumption with variations in speed. 2000 w. Horseless Age—April 2, 1913. No. 41053.

Rolls-Royce

A Trial of a Rolls-Royce. An account of a trip, including hill climbing, with remarks on the number of speeds. 2000 w. Autocar—July 26, 1913. No. 44161 A.

Rover

The 12 h. p. Rover Car. Illustrated detailed description. 1300 w. Auto Jour—Jan. 18, 1913. No. 39455 A.

Salesrooms

Packard Salesroom and Service Station, Hartford, Conn. Illustrated description. 1500 w. Horseless Age—May 7, 1913. No. 41988 C.

The Hawkins-Half Salesroom and Garage, Houston, Tex. Illustrated description of the garage and its management. 1500 w. Horseless Age—May 7, 1913. No. 41987 C.

The Locomobile Salesroom, Atlanta, Ga. Illustrated description of an attractive salesroom. 2000 w. Horseless Age—May 7, 1913. No. 41982 C.

Schacht

Schacht Models for 1913. Illustrates and describes the latest models of this Cincinnati Co. 1200 w. Horseless Age—Feb. 5, 1913. No. 39731.

Self-Starters

American Starting System for Gasoline Motors (Amerikanische Anlasser für Benzin-Motoren). P. M. Heldt. First part describes compressed air and compressed gas starters as applied to some of the leading makes. Ills. Serial. 1st part. 1400 w. Motorwagen—Oct. 10, 1912. No. 37457 D.

Fitting a Car with a Self-Starter. Albert L. Clough. Considers electric and air starters and their installation. 1700 w. Horseless Age—April 2, 1913. No. 41050.

See also Electric Systems, under Automobiles.

Service System

Ford Service System. Explains the building and service scheme used for supplying the metropolitan district with cars and repairs. 3300 w. Automobile—Feb. 13, 1913. No. 39847.

S. G. V.

S. G. V. 1914 Models With Electric Starter and Transmission. Illustrated description. 1500 w. Horseless Age—June 9, 1913. No. 42695.

Sheffield-Simplex

The 30 h. p. Six-cylinder Sheffield-Simplex. Illustrated description of an entirely new design. 1500 w. Autocar—Nov. 9, 1912. No. 37628 A.

Silence

Skillful Work is Silencing American Motors and Chassis. Information concerning present practice and means em-

Sleeve Valve

played to secure quietness. Ills. 3500 w. Automobile—Nov. 28, 1912. No. 37932.

Sleeve-Valves

The Knight Type Sleeve-Valve Motors. Henry H. Hower. Illustrates and describes its construction, explaining its advantages. 1500 w. Sib Jour of Engng—May 1, 1913. No. 42417 C.

Argyll Sleeve-Valve Tests. A record of tests at Brooklands. Ills. 1500 w. Auto Jour—May 24, 1913. No. 42739 A. See Engine Tests, under *Automobiles*.

Slide Valves

The Question of Slide Valves (Zur Frage der Schiebermotoren). Mr. Knight and Herr. Riedler. Arguments for and against. Ills. 9400 w. Auto Rund—Jan 31, 1913. No. 40051 D.

Spark Plugs

Manufacturing J-D Spark Plugs. Illustrates and describes the processes. 2500 w. Horseless Age—July 30, 1913. No. 44098.

Speedometers

Calibrating Speedometers. Gives results of some measurements made to ascertain the effect of tire depression. 1600 w. Autocar—Oct. 11, 1913. No. 45967 A.

Springs

The Design of Automobile Springs. J. Coapman. Gives tables, charts and formulae derived to enable construction in accordance with best practice. 1000 w. Am Mach—Nov. 14, 1912. No. 37381.

The Commercial Testing of Leaf Springs. David Landau. Considers apparatus used and methods of testing. Ills. 3000 w. Horseless Age—Oct. 30, 1912. Serial. 1st part. No. 37203.

The Testing of Motorcycle Springs. W. M. G. Snow. Describes the testing device and states results which differ from accepted theory. 1000 w. Am Mach—Dec. 19, 1912. No. 38262.

Leaf Springs. Leavitt J. Lane. Considers the importance of steel composition, factors of design, tests, etc. 1800 w. S A E Bul—Dec., 1912. No. 39305 N.

Springs and Suspensions at the Shows. Asher Golden. Discusses European vs. American practice, details, materials, etc. 2500 w. Horseless Age—Jan. 15, 1913. (Special.) No. 39225 C.

Springs. G. H. Baillie. Read before the Inst. of Auto Engrs. An account of investigations made, facts observed, and theories based on them. 6000 w. Autocar—May 10, 1913. No. 42274 A.

Defects in Springs. G. H. Baillie. From a paper read before the Inst. of Auto. Engrs. Gives results of an investigation of springs, and remarks on their importance. Ills. 2500 w. Automobile—

AUTOMOBILES

May 29, 1913. Serial. 1st pat. No. 42559.

Springing Systems. W. G. Aston. A review of some present day forms of car suspension for front and rear axles and their merits or demerits. Ills. 4000 w. Autocar—June 7, 1913. No. 42874 A.

Tests on the Spring Mountings of Motor Cars (Versuche über die Abfederung von Kraftfahrzeugen). E. Bobeth. Describes methods of testing resilience in spring material. Ills. Serial, 1st part. 1600 w. Motorwagen—July 10, 1913. No. 44664 D.

Starters

What There Is to Be Seen in Self Starters. Harry E. Dey. Illustrates and describes systems exhibited at the New York shows. 4500 w. Horseless Age—Jan. 15, 1913. (Special.) No. 39224 C.

Electric Self-starters. J. Dalrymple Bell. Detailed discussion of the electric engine starting system. 2000 w. Autocar—May 17, 1913. No. 42526 A.

The Bijur Lighting and Starting System. Illustrated detailed description of this system which is built for either six or twelve volts. 2000 w. Horseless Age—June 4, 1913. No. 42694.

Motor Starters. Ten minute papers, prepared by manufacturers' representatives, describing types. Ills. 47 pp. S. A. E. Bul—June, 1913. No. 43340 N.

Starting Gear for Automobile Engines (Anlassvorrichtung für Automobilmotoren). K. Schirmbeck. The origin of the self-starter, and descriptions of the four systems; springs, compressed air, electric, and explosive mixtures. Serial, 1st part. 3200 w. Auto Rund—Sept. 15, 1913. No. 46055 D.

See also Electric Systems and Lighting, under *Automobiles*.

Stearns-Knight

Stearns-Knight Motor Continues Unchanged. The motors are practically unchanged but fitted with new bodies. Ills. 2500 w. Automobile—Oct. 31, 1912. No. 37205.

Steering

The Direction of Automobiles (Etude sur la direction des voitures automobiles). P. Massot. A study as to the best method of mounting the steering rods. Ills. 3600 w. Rev de Mecan—July, 1913. No. 45332 E + F.

Steering Gear

Steering Gear Design Is Conservative. Illustrates and describes types. The worm-and-gear types seem to be in greatest favor, but screw-and-nut construction are numerous. 2500 w. Automobile—March 6, 1913. No. 40338.

Steering Gear

Stoewer

AUTOMOBILES

Tractors

Stoewer

The New 15-30-H.P. Stoewer Chassis. Illustrates and describes improvements introduced in this new model. 1000 w. Auto Jour—Feb. 8, 1913. No. 39903 A.

The 13.9 H. P. Stoewer Car. Illustrates and describes features of this small-powered car. 2000 w. Auto Jour—June 21, 1913. No. 43368 A.

Straker-Squire

The 15 H. P. Straker-Squire. Illustrated description and information concerning this new car. 1600 w. Auto Jour—May 10, 1913. No. 42265 A.

Studebakers

Three New Studebakers. Illustrates and describes new designs. 2500 w. Automobile—Nov. 14, 1912. No. 37576.

The 20-25 h. p. Studebaker. Illustrated description of this carefully designed car. Electric lighting and engine starting. 1000 w. Autocar—May 31, 1913. No. 42763 A.

Some Details of Studebaker Cars. Illustrates and describes new details introduced in the latest models. 1400 w. Horseless Age—July 9, 1913. No. 43669.

Suspension

3-Point vs. 4-Point. American engineers discuss the relative merits of the two systems of motor suspension. 2500 w. Automobile—Nov. 14, 1912. Serial. 1st part. No. 37575.

The New Cowey Pneumatic Suspension. Illustrated explanation of the design and its working. 1200 w. Auto Jour—Feb. 1, 1913. 39771 A.

Testing

Chassis Testing Apparatus. P. P. Dean. Presents advantages claimed for stationary over-road testing, discussing points of value in designing a standard, reasonably priced outfit for rear-wheel testing. Ills. Also discussion. 6000 w. S A E Bul—Aug., 1913. No. 45090 N.

Tires

The Choice, Care and Repair of Automobile Tires. C. H. Calkins. Reviews the history of their development, states their advantages, discusses sizes and loads, construction, substitutes, etc. 6800 w. Horseless Age—Dec. 18, 1912. No. 38309.

The Making of a Pneumatic Automobile Tire. E. R. Hall. Illustrated detailed description of the work from the crude rubber to the finished product. 3500 w. Sci Am—Jan. 11, 1913. No. 39101.

Tire Progress Shown by Anti-Skid Treads. Illustrated review of types. 5000 w. Automobile—Jan. 30, 1913. No. 39575 C.

Pneumatic Tires and Their Working

Conditions. C. P. A. Van Ferls. A detailed study. 3000 w. Horseless Age—Feb. 19, 1913. No. 39968.

Solid Tires. Illustrated review of the heavy tires now on the market for all weights of vehicles. 5400 w. Automobile—Feb. 13, 1913. No. 39848.

Pneumatic Tires. P. W. Litchfield. Reviews the history of pneumatic tire design, the causes of many changes, discussing some of the problems. 4000 w. S A E Bul—May, 1913. No. 42477 N. Helpful Hints on the Purchase and Care of Tires. F. A. Henderson. 1500 w. Horseless Age—Sept. 24, 1913. No. 45434.

Tire Repairs—Roadside and Garage. J. Edward Schipper. The present number deals with roadside methods of curing troubles. 2500 w. Automobile—Sept. 18, 1913. Serial, 1st part. No. 45210.

Automobile Tires (Der Automobilpneumatik). Gerhard Hühener. The duties and purposes of pneumatic tires and their manufacture. Ills. 4000 w. Auto Rund—Aug. 31, 1913. No. 46054 D.

Torque

Motor Torque, Its Action and Reaction. Otto M. Burkhardt. A mathematical investigation showing how the vertical loads on springs and tires are affected by the motor power. Ills. 1700 w. Horseless Age—Sept. 24, 1913. No. 45435.

Automobile Rear Axle Design. K. W. Najder. A discussion of chain and gear transmissions. 1800 w. Mach, N Y—Sept., 1913. No. 44844 C.

Traction Engines

The Lining-Up of a Traction Engine. Describes the various operations leading to the lining up of an engine used for tractive work. Ills. 2500 w. Mech Wld—Jan. 31, 1913. No. 39790 A.

Another Method of Lining-Up a Traction Engine. Describes a method aiming to eliminate all unnecessary chipping and filing, more accurate alignment, more rigid construction, and shorter time. Ills. 1800 w. Mech Wld—March 14, 1913. No. 40818 A.

A Traction Engine Whose Four Wheels Are Driving Wheels. Illustrated description. 1000 w. Engng & Con—Aug. 13, 1913. No. 44346.

Tractors

Electric Tractor for Use on City Streets, Pennsylvania Railroad. Illustrates and describes a tractor recently constructed in the Pennsylvania shops at Altoona, Pa. 900 w. Ry & Engng Rev—Feb. 1, 1913. No. 39610.

Economies of the Farm Tractor. Philip S. Rose. An illustrated explanation.

Consult Classification of the Index. See page 9.

Transmission

tion of the new way of tilling the soil. 2000 w. Sci Am—Feb. 1, 1913. No. 39608.

The Problem of the Small Farm Tractor. Lynn W. Ellis. Discusses the agricultural, mechanical and economical factors that must be considered. Ills. 3500 w. Sci Am—June 7, 1913. No. 42668.

Advantages of Tractor Transportation. Discusses various types and their driving systems. Ills. 2000 w. Sci Am—Aug. 30, 1913. No. 44899.

Transmission

See also Engines, under *Automobiles*.

Valve Gears

Side Valve Gear Operation (Der Antrieb von Schiebersteuerungen). Herr Praetorius. Diagrams illustrating the principles of operation. 2000 w. Motorwagen—Feb. 28, 1913. No. 41445 D.

Valves

Criticisms of Non-Poppet Valves To-Date. Eugene P. Batzell. Critical review of present practice in construction and design of various types of rotary and sleeve-valve motors. Ills. 2000 w. Automobile—Dec. 19, 1912. Serial. 1st part. No. 38317.

Wheels

Pros and Cons of Wire Wheels. Henry Souther. Compares wood and wire constructions. Ills. 2500 w. Automobile—Feb. 13, 1913. No. 39846.

Schermack Spring Wheel Acts on New Principle. Illustrated description of the design and action, and of the resiliograph devised to test the vibration-absorbing qualities. 1000 w. Automobile—Feb. 27, 1913. No. 40234.

Wheels and Tires for Heavy Loads (Les roues et les bandages pour poids lourds). D. Renaud. Studies of the destructive forces to be counteracted in the

COMBUSTION MOTORS

Diesel Engines

design of automobile truck wheels. Ills. Serial. 1st part. 3200 w. Genie Civil—Feb. 22, 1913. No. 40596 D.

Motor Truck Wheels. Arthur J. Slade. A discussion of the relative merits of wood and metal wheels. 3000 w. S A E Bul—May, 1913. No. 42473 N.

The Wire Wheel—Where It Stands Today. Earle A. Ryder. Gives reasons for increasing the popularity of the wire wheel and describes present types. 3000 w. Horseless Age—April 30, 1913. No. 41828.

Making Hayes Wheels. Illustrated description of methods used in a plant at Jackson, Mich. 2000 w. Horseless Age July 2, 1913. No. 43440.

Wire Wheels for Pleasure Cars. George W. Houk. Gives a brief history of the wire wheel as developed in England and its adaptation to the American automobile for American roads. 2500 w. S A E Bul—Sept., 1913. No. 46122 N.

Wolseley

The New Wolseley Models. Outlines the new policy of the Wolseley Co. of confining the output to three models. Illustrates and describes the cars. 2500 w. Autocar—Oct. 19 and 26, 1912. Serial. 2 parts. No. 37285 each A.

Wolseley Cars for the Motor Show. Drawings and description of changes in design and details. Plate. 3000 w. Eng—Nov. 1, 1912. No. 37398 A.

Worm Gear

Worm Gear. F. W. Lanchester. Read before the Inst. of Auto. Engrs., London. (Condensed.) Reviews the use of worm transmission in road automobiles, describes the new method of testing introduced and discusses details. 4000 w. Horseless Age—June 25, 1913. No. 43190.

COMBUSTION MOTORS

Cams

See same heading, under *Machine Elements and Design*.

Carburetion

See same heading under *Automobiles*.

Combustion

The Flameless or "Convergent" Combustion of Gases. Dr. Jean Meunier. A study of the action of incandescent electrical conductors in firedamp mixtures, and the peculiarities of convergent combustion. Ills. 3000 w. Col Guard—Jan. 10, 1913. No. 39255 A.

Flameless Combustion (Flammelose Feuerungen). C. Kinzbrunner. Discussing the construction and operation of the Bone-Schnabel boiler and system. Plates. Serial, 3d part. 2500 w. Feuerungstechnik—Jan. 1, 1913. No. 40021 D.

Cooling

Cylinder Cooling in Small Internal-Combustion Engines. Briefly reviews air cooling and water cooling methods. 1600 w. Auto Jour—Feb. 8, 1913. No. 39904 A.

Diagrams

Valve Diagrams for Four-Cycle Engines (Steuerungsdiagramm für Viertaktmaschinen). J. Magg. An application of the steam indicator diagram to internal combustion engines. Ills. 1700 w. Zeit des Ver deutscher Ing—Feb. 15, 1913. No. 40540 D.

Diesel Engines

The Application of Diesel Engines to Land and Marine Work. D. M. Bright. Brief review of the early history of the Diesel engine with illustrated description

Consult Classification of the Index. See page 9.

Diesel Engines

COMBUSTION MOTORS

Diesel Engines

and statement of advantages, applications, etc. 2000 w. Can Engr—Nov. 7, 1912. No. 37341.

The Diesel Engine (Le Moteur Diesel). E. Sauvage. Reviews the history, principles, operation and development of this prime mover. 5400 w. Rev Gen des Sciences—Oct. 30, 1912. No. 37505 D.

Principles of the Diesel Oil Engine. Herbert Haas. Describes the Diesel principle, and gives figures on cost of power plant. Ills. 4500 w. Eng & Min Jour—April 26, 1913. No. 41544.

The Oil Consumption and Mean Effective Pressure of Diesel Engines. R. Royds and J. W. Campbell. A discussion of the most economical mean effective pressures. 2500 w. Engr, Lond—April 11, 1913. No. 41395 A.

The Development of the Diesel Internal Combustion Engine. Gaston L. Carels. A review of successive alterations effected in the Diesel engine before reaching its present stage, and the great number of ways in which it is now being applied. 4500 w. Cassier's (Lond)—March 1913. No. 42100 E.

Modern Continental Oil Engine Practice. Alfred Büchi. Particularly concerns the Diesel engine. A study of fuels available, locomotives, stationary vertical and horizontal engines, and marine engines. Ills. 7200 w. Cassier's (Lond)—March, 1913. No. 42101 E.

Large Diesel Engines. Dr. Paul H. R. Nettmann. Some considerations relating to their increase of output, power limitations, evolution and design, with special reference to the combustion of petroleum residues and heavy tar-oils. Ills. 6900 w. Cassier's (Lond)—March, 1913. No. 42102 E.

British Oil Engine Practice. W. D. Wansbrough. An extensive review of the lines of development and designs practiced by British constructors of Diesel engines. Ills. 11400 w. Cassier's (Lond)—March, 1913. No. 42104 E.

The Development of Diesel Engines for Stationary Purposes. Geo. E. Heath. A brief outline of the application of the Diesel principle for stationary purposes, and future possibilities. Ills. 3000 w. Cassier's (Lond)—March, 1913. No. 42106 E.

A French Diesel Engine. Illustration with detailed description of 350 h. p. marine Diesel engine, F. & C. de la Méditerranée. 3500 w. Engr, Lond—May 2, 1913. No. 42008 A.

Some Stationary British Diesel Engines. Describes various types, briefly outlining the main features of design and describing more particularly the minor details. Ills. 3300 w. Engr,

Lond—May 9, 1913. Serial. 1st part. No. 42291 A.

Recent Diesel Marine Engines, and Particularly the Trials of the Oil-Engine "Juno" (Les nouveaux moteurs Diesel marins et en particulier les essais du pétrolier "Juno"). A list of Diesel-engined ships, either in service or under construction, and comparative results of tests of the "Juno." Ills. 4800 w. Tech Mod—April 1, 1913. No. 41523 D.

The Possibilities and Limitations of the Marine Diesel Engine. W. P. Sillicine. Advantages and disadvantages of this prime mover as applied to tank vessels, cargo vessels, passenger liners, and naval service. 4800 w. Cassier's (Lond)—March, 1913. No. 42103 E.

The Application of Diesel Engines to Battleships (Application des moteurs Diesel aux navires de guerre). P. Dumanois. A study of conditions to be met in weight and power. Diagrams. 7800 w. Tech Mod—April 15, 1913. No. 42172 D.

First American-Built Marine Diesel Engines. Brief illustrated description of types. 1200 w. Power—June 3, 1913. No. 42657.

The John Samuel White Diesel Engine. Illustrates and describes this British-built Diesel engine. 4000 w. Engr, Lond—June 6, 1913. No. 42889 A.

The Cost of Generating Power with Diesel Oil Engines. Gordon Kribs. Gives statistics from plants at Sherman and Cleburne, operated by the Texas Power & Light Co. 1000 w. Can Engr—July 10, 1913. No. 43681.

Power Applications of Diesel Engines in Industrial Plants. C. Van Langendonck. Describes characteristic types and considers their installation requirements. Ills. 1200 w. Engineering Magazine—Sept., 1913. No. 44767 B.

Two-Cycle "Semi-Diesel" Engine. Illustrates and describes Petters 150 h. p. three-cylinder semi-Diesel engine. 800 w. Engr, Lond—Aug. 15, 1913. No. 44731 A.

Large Diesel Engines, Their Fuels, Construction and Applicability (Grossdieselmotoren, ihre Brennstoffe, Konstruktion und Anwendungsgebiete). A chart study of the properties in seven possible fuels, and a review of present types. Ills. 3000 w. Zeit des Ver deutscher Ing—July 19, 1913. No. 44654 D.

The Diesel Engine in America. Illustrated account of the engines of the Diesel type built in America, with critical comment on the lack of progress. 2000 w. Engr, Lond—Aug. 22, 1913. No. 44925 A.

Diesel Motors

The Twentieth Year of the Diesel Engine (*Les Vingt Ans du Moteur Diesel*). Aimé Witz. A review of the development occurring in the past twenty years since its inception. 7200 w. *Tech Mod*—Aug. 1, 1913. No. 45333 D.

Diesel Engine Cylinder Dimensions. Editorial discussion of the proposed system to work Diesel engines in an atmosphere much denser than that we breathe. 2000 w. *Engng*—Sept. 26, 1913. No. 45740 A.

New Generator for Diesel Engines. Illustrated description of a new form of alternator for coupling to Diesel engines, built on the "outer-pole" principle. 1000 w. *Engr*, Lond—Sept. 19, 1913. No. 45574 A.

Horizontal Diesel Engines at the Kingston Electricity Works. Describes new plant at the Kingston-on-Thames Electricity Works. 1000 w. *Engr*, Lond—Oct. 3, 1913. No. 45867 A.

Explosion of a Diesel Engine Receiver at Bray. Report by G. S. Taylor on the circumstances attending the explosion of a compressed air receiver of a Diesel engine which occurred July 10, 1912. Also editorial. Ills. 7000 w. *Mech Engr*—Oct. 3, 1913. Serial, 1st part. No. 45850 A.

The Ghent International Exposition (*Weltausstellung Gent*). Description of the 400 hp. Diesel engines exhibited by the Société Anonyme des Forges et Chantiers de la Méditerranée. Ills. Serial, 1st part. 1700 w. *Elec Rund*—Aug. 21, 1913. No. 46070 D.

See also Pumping Plant, under *Hydraulic Machinery*, and Locomotives, under *RAILWAY ENGINEERING, Motive Power and Equipment*.

See also Diesel Engines and Motor Ships, under Marine and Naval Engineering; and Gas Engines, under Mechanical Engineering, *Combustion Motors*.

Diesel Motor

An Interesting Small-Powered Diesel Motor. Illustrates and describes an Italian Diesel motor designed on marine lines and showing new features of interest. 1600 w. *Engr*, Lond—March 14, 1913. No. 40833 A.

See also Central Stations, under *ELECTRICAL ENGINEERING, Generating Stations*, and Diesel Engines, under *MARINE AND NAVAL ENGINEERING*.

Engine Cooling

Water Supply for Internal-Combustion Engines. A. N. Rye. Describes a system installed in a generating station containing 500 h. p. of Diesel engines and 960 h. p. of gas engines. 1800 w. *Elec Rev*, Lond—Aug. 1, 1913. No. 44304 A.

A New Method of Cooling Gas En-

COMBUSTION MOTORS

gines. Bertram Hopkinson. Describes a method of internal injection of water against the metal surfaces. 5000 w. *Inst of Mech Engrs*—July 29, 1913. No. 44317 N.

The Cooling of Gas Engines. Editorial review of Prof. Bertram Hopkinson's paper before the Inst. of Mech Engrs. 2200 w. *Mech Engr*—Aug. 8, 1913. No. 44451 A.

Engines

Increasing the Power of Combustion Motors and a New Six-cycle Motor (*Die Steigerung der Leistung von Verbrennungsmotoren und ein neuer Sechstaktmotor*). Emil Schimanek. Theoretical calculations on increased power through six-cycle engines; principles and operation of the author's motor. Ills. 5500 w. *Zeitschr des Ver deutscher Ing*—Jan. 25, 1913. No. 40045 D.

Engine Tests

Tests on Small Gasoline Engines. F. M. and E. A. White. Describes engines and methods of conducting tests, giving conclusions. 1500 w. *Power*—Aug. 26, 1913. No. 44585.

Engine Troubles

Gasoline-Engine Troubles and Their Symptoms. A. L. Brennan, Jr. Considers causes of failure to start, of low efficiency, of misfiring and other operations. 900 w. *Power*—Sept. 23, 1913. No. 45275.

Exhibitions

The Smithfield Club Show. Illustrates and describes the exhibits, especially the internal combustion engines. 5000 w. *Engr*, Lond—Dec. 13, 1912. No. 38530 A.

Internal-Combustion Engines at the Ghent Exhibition. Describes the engines shown, illustrating the internal combustion engine for navy tank steamer. 1400 w. *Engng*—Aug. 1, 1913. No. 44321 A.

See also same headings, under *Aeronautics*, and *Automobiles*.

Flywheels

Note on Fly-Wheel Design for Internal-Combustion Engines. Robert Oliphant Boswall. Investigates the difference that exists in the design of wheel to suit both engines governed by throttling and engines governed on the hit and miss principle. 2500 w. *Engng*—Dec. 6, 1912. No. 38243 A.

Fuels

Heavy Oil as Fuel for Internal Combustion Engines. Irving C. Allen. Gives the result of an extended search in the United States and abroad for some means of more effectively burning the heavy asphaltum oils. With bibliography. 36 pp. U. S. Bureau of Mines—Tech. paper 37. No. 43617 N.

Fuels

Fuels

A Remarkable Coal-Gas Engine. Illustrated description of the engine invented by Dr. Archibald Low, working on coal. 1000 w. Elec Rev, Lond—Nov. 15, 1912. No. 37806 A.

Comparative Fuel Values of Gasoline and Denatured Alcohol in Internal Combustion Engines. R. M. Strong and Lauson Stone. A detailed description of the equipment used, the methods of procedure, and the complete logs and deductions from the various tests. Ills. 236 pp. U S Bureau of Mines—Bul. 43. No. 37399 N.

Benzine and Benzol (Benzin und Benzol). K. Dieterich-Helfenberg. A discussion on the diverse properties of these two combustion-engine fuels, and studies of their characteristics. 4500 w. Zeit d Mitt Motorwagen Ver—Oct. 15, 1912. No. 37455 D.

Naphthalene Motors (Les Moteurs a Naphtaline). L. Ventou-Duclaux. General consideration in the use of naphthalene as a combustible in combustion motors. Ills. 2800 w. Tech Mod—Nov. 1, 1912. No. 37509 D.

The Use of Naphthalene as a Combustible in Combustion Motors (Utilisation de la Naphtaline comme combustible dans les moteurs a explosions). M. L. Ventou-Duclaux. Discusses conditions governing its use, advantages obtained, arrangement of carburetors, etc. Ills. 12,000 w. Mem Soc Ing Civ de France—Oct., 1912. No. 38482 G.

Power from Kerosene. L. W. Ellis and W. R. Dray. Describing a system using oil, kerosene and distillates in the ordinary type of gas engine. Ills. 3000 w. Sci Am Sup—Feb. 15, 1913. No. 39888.

Developments in Oil Burning. E. H. Peabody. Illustrates and describes methods of introducing air to secure proper ignition with the oil spray. 1200 w. Power—Feb. 18, 1913. No. 39896.

Driving Media for Internal Combustion Engines (Die Treibmittel des Verbrennungsmotors). Oscar Schaarschmidt. Discussion on the relative merits of the different grades of petroleum products as fuel. 2000 w. Schiffbau—Feb. 26, 1913. No. 40553 D.

Kerosene and the Important Factors in Its Combustion. Harrington Emerson. Discusses the hydrocarbons and their characteristics, perfect combustion, and the inherent difficulties. 3500 w. Horseless Age—April 2, 1913. No. 41054.

The Influence of Flame Temperature on the Value of Combustibles (Ueber den Einfluss der Flammentemperatur bei der Bewertung der Brennstoffe). A. Gwigzner. Plans for an equitable basis for the

COMBUSTION MOTORS

Gas Engines

cost of fuels by their heat values, and tables on the values of different fuels. 6500 w. Stahl u Eisen—March 6, 1913. No. 41402 D.

The Gasoline and Kerosene Situation. From an address by John A. Secor before the Society of Automobile Engineers (Indiana Section) at Indianapolis, Feb. 18, 1913. 2500 w. Sci Am—May 17, 1913. No. 42099.

Petrol and Alcohol Internal Combustion Engines. Editorial review of Bulletin No. 43, of the U. S. Bureau of Mines. 4000 w. Engng—May 23, 1913. No. 42779 A.

The Question of Cheap Carburetion (La question du carburant à bon marché). G. Lumet. The fuel problem and possible resources. 4000 w. Tech Mod—May 15, 1913. No. 43068 D.

Fuel and Lubricants for Internal Combustion Engines. B. H. Arnold. Discusses petroleum, its occurrence, composition and refining; the use of gasoline and naphtha in the engine, specifications and purchase, and possibilities of other liquid fuels. 4500 w. Gen Elec Rev—Oct., 1913. No. 45581 C.

The Chemical Examination of Liquid Fuels. W. Hamilton Patterson. From *Jour. of Soc. of Chem. Ind.* Gives results obtained in the examination of various liquid fuels. 1500 w. Chem Engr—Sept., 1913. No. 45594 C.

The Production of Motor Spirit from Coal. A. Rollason and A. W. Taylor. Investigates the yield of motor spirit and heavy oil from coal, the expenses and working costs. 2000 w. Col Guard—Sept. 19, 1913. No. 45566 A.

Motor Oils (Ueber Treiböle). E. J. Constam and P. Schläpfer. Detailed analyses of fuel oils of all kinds, their specific gravities, flash points, viscosity, water content, etc. Ills. Serial, 1st part. 4400 w. Zeit des Ver deutscher Ing—Sept. 20, 1913. No. 46040 D.

See also same heading, under *Automobiles*, and under *Steam Engineering*; *Combustion*, under *Combustion Motors*; and *Oil Fuel*, under *Marine and Naval Engineering*; also *Natural Gas and Petroleum Products*, under *MINING AND METALLURGY*, *Minor Minerals*; and *Benzol*, under *Mining and Metallurgy*, *Coal and Coke*.

Gas Engine Power

An Example of Low Cost Gas Engine Power. Gives operating costs in two Cincinnati industrial establishments using natural gas, illustrating and describing one of the engines. 400 w. Ir Age—Dec. 26, 1912. No. 38539 C.

Gas Engines

Modern Gas-Engine Design. Discusses

Consult Classification of the Index. See page 9.

Gas Engines

COMBUSTION MOTORS

Gas Engines

some of the difficulties of design and gives the correct proportions which actual working conditions have approved. 1800 w. Mech Wld—Nov. 15, 1912. Serial. 1st part. No. 37817 A.

Operating Gas Engines. A. L. Brennan, Jr. Briefly considers ignition troubles and other causes of failures. 1500 w. Power—Nov. 26, 1912. No. 37784.

Four-Cylinder Vertical Gas-Engine. Illustrated description of a British engine recently shipped to New Zealand for a tramway power station. 1200 w. Engng—Nov. 8, 1912. No. 37639 A.

Gas Engine with Corliss Releasing Valve Gear. Illustrated description of an engine in service in Racine, Wis. 800 w. Power—Nov. 19, 1912. No. 37618.

Groundwork for Experiments on Two-Cycle Engines (Grundlagen für die Untersuchung von Zweitaktmaschinen). P. Meyer. Fundamental principles of operation. Diagrams. 5000 w. Zeitschr des Ver deutscher Ing—Oct. 5, 1912. No. 37447 D.

Compound Engines for Explosion, or Combustion and Air Compression (Moteurs mixtes à explosion ou à combustion et à air comprimé). M. L. Letombe. Automatic starting and overloading of engines. Ills. 7500 w. Mem Soc Ing Civ de France—Sept., 1912. No. 37485 G.

The Modern Gas-Engine. A. Vennell Coster. Abstract of a lecture before the Nottingham Engng Soc. A general survey of the development, its fuels, efficiencies, etc., particularly recent developments in construction. Ills. 5000 w. Engng—Nov. 22, 1912. No. 38034 A.

Gasoline Engine Economy. A. E. Potter. From a paper read before the Nat. Gas Assn. Considers the factors affecting the economy. 1400 w. Power—Dec. 17, 1912. No. 38218.

A System of Gas Engine Governing. George S. Cooper. From a paper read before the Ohio Soc. of Mech., Elec., & Steam Engrs. Discusses governing methods, and their fuel economy. Ills. 2000 w. Power—Dec. 10, 1912. No. 38104.

Gas Engines at the Central Furnaces. A. D. Williams. Illustrated description of a gas-engine installation at the plant of the American Steel & Wire Co., at Cleveland, O. 2500 w. Power—Dec. 3, 1912. No. 38018.

Some Practical Cure for Gas-engine Troubles. Hints concerning points that need attention. 1800 w. Mech Wld—Dec. 6, 1912. No. 38241 A.

The Present Position of the Gas Engine. Percy R. Allen. A comparison of working costs and relative advantages of Diesel and gas engines. Ills. 11400 w.

Cassier's (Lond) — March, 1913. No. 42105 E.

Heat Balance of a Gas Engine. Julian C. Smallwood. How to make a complete economy test of a gas engine. 1500 w. Power—April 1, 1913. No. 40966.

Recent Developments in Engines for Iron and Steel Works. H. H. Hoffman. Illustrates and describes recent types of large power gas engines and their applications in iron and steel works. 1600 w. Ir & Coal Trds Rev—April 4, 1913. No. 41247 A.

Some Developments of the Gas Engine. Edward Brown. Considers the two-stroke cycle engines, the four-stroke cycle engines, and the development in America. 3000 w. Power—April 15, 1913. No. 41209.

Notes on a Bituminous-Producer Gas Engine Plant. J. R. Crowell. Read before the S. African Inst. of Engrs. Gives particulars of gas engines using gas produced from S. African bituminous coals. Ills. 3000 w. Mech Engr—April 4, 1913. No. 41229 A.

Heavy Duty Gas Engines. Illustrates and describes types of motor-driven boats, explaining the service they are rendering. 2500 w. Marine Rev—May, 1913. No. 42084 C.

A Proposed Slow-Combustion Gas Engine. R. J. Kingston and T. P. Shilston. Considers the present limitations regarding the size and thermal efficiency of the explosion gas engine, and submits a proposed design to overcome difficulties. 2000 w. Mech Wld—April 8, 1913. Serial. 1st part. No. 41761 A.

Gas and Oil Engines for Electric Supply Stations. A. N. Rye. Gives results obtained in a central station on the Island of Guernsey, depending almost entirely on gas and Diesel engines, and where both classes of engines are run in the same power house under the same conditions. 2500 w. Elec Rev, Lond—May 2, 1913. No. 41995 A.

Gas-Engine Sounds. A. L. Brennan, Jr. Considers sounds produced by the normal operation, and other sounds, and what they indicate. 1500 w. Power—May 20, 1913. No. 42235.

Practical Operation of Gas Engines Using Blast-Furnace Gas as Fuel. Charles C. Sampson. Discusses the features upon which the operation depends. Ills. 5000 w. Jour Am Soc of Mech Engrs—May, 1913. No. 42408 D.

The Illmer Two-Stroke-Cycle Gas Engine. Illustrated description of an engine designed for heavy-duty service, along the lines of steam-engine practice. 1200 w. Power — May 27, 1913. No. 42398.

Gas Engines

COMBUSTION MOTORS

Gas Turbines

The Gas Engine in the Steel Industry. Heinrich J. Freyn. From a paper read before the Am. Ir. & St. Inst. Compares the installation and operating costs of blast furnace and steel works gas power plants with other types of power plants. Also discussions. 11500 w. Ir Age—May 29, 1913. No. 42557 C.

1000 Horse-Power Four-Cylinder "Premier" Gas Engine. Illustrates and describes a single-acting horizontal gas-engine of English manufacture. 1500 w. Engng—May 30, 1913. No. 42782 A.

The Working Fluid of Internal-Combustion Engines. Dugald Clerk. The Gustav Canet lecture delivered before the Jun. Inst. of Engrs. Discusses the temperature of the working fluid, the internal energy, loss of energy, combustion, etc. 7800 w. Engng—July 4, 1913. Serial, 1st part. No. 43721 A.

Gas Engine Efficiency. A. L. Brennan, Jr. How to locate troubles, and their remedies. 4000 w. Rudder—July, 1913. Serial, 1st part. No. 43495 C.

Gas Engine Practice. W. Fennell. Abstract of a paper read before the Birmingham Dist. Elec. Clubs. Remarks are confined to engines of from 12 in. to 36 in. diameter pistons, such as would be met with in stations up to 3000 kw. capacity. 3000 w. Mech Engr—July 4, 1913. No. 43713 A.

The Big Ford Gas Engine. F. R. Low. Illustrated detailed description. 700 w. Power—July 22, 1913. No. 43844.

A Model Gas Engine Plant in Japan. Brief illustrated description of a Mond gas plant installed at the Kawasaki dockyard, Japan. 1000 w. Elec Rev, Lond—July 25, 1913. No. 44162 A.

Scavenging Tests on Gas Engines (Ueber Ausspülverfahren bei Gasmaschinen). A. Nolte. An indicator study of the effectiveness of the exhaust stroke. Diagrams. 2500 w. Stahl u Eisen—Aug. 7, 1913. No. 44612 D.

Removing Carbon from Gas Engines. Joseph A. Anglada. Gives experiences with denatured alcohol for cleaning the engine interior. 2000 w. Ir Age—Sept. 18, 1913. No. 45203 C.

Producer Gas Engines. Reports results obtained with a type of engine developed by the Wolverine Motor Works, of Bridgeport, Conn. Ills. 2500 w. Marine Rev—Sept., 1913. No. 44964 C.

The Illmer Gas Engine. Illustrated description of a double-acting machine operating on a two-stroke cycle. 2000 w. Prac Engr, Chicago—Sept. 15, 1913. No. 45135.

See also Fuel, under *Combustion Motors*, and Central Stations, under *ELECTRICAL ENGINEERING*, *Generating Stations*, and Gas Power, under *Power and Transmission*, and Shop Practice, under *Machine Works and Foundries*.

Gases

Industrial Combustible Gases. J. M. Rusby. An outline of the qualities and methods of production of the more important gases used in the arts, etc. Ills. 11800 w. Jour Fr Inst—July, 1913. No. 44028 D.

Gasoline

The Condensation of Gasoline from Natural Gas. George A. Burrell and Frank M. Siebert. Read before the Am. Chem. Soc. Gives results of work performed by the Bureau of Mines. 3000 w. Chem. Engr—Sept., 1913. No. 45590 C.

Gas Producers

Experiments on a Peat Suction-Gas Installation (Beproeving eener turf-zuig-gasinstallatie). J. Rutten and Chr. Muller. Details of experiments and results. Ills. 2200 w. De Ingenieur—Oct. 19, 1912. No. 37481 D.

The Distillation Furnace (Die Entgasungsöfen). Dr. Volkmann. Modern retort furnaces in the production of illuminating gas. Ills. Serial, 1st part. 2200 w. Feuerungstechnik—Feb. 1, 1913. No. 40025 D.

A Bituminous Gas Producer Plant. A. A. Potter. Describes a plant installed at the Kansas State Agricultural College. Ills. 1500 w. Power—Dec. 31, 1912. No. 38700.

See also Peat, under *MINING AND METALLURGY*, *Coal and Coke*, and Internal Combustion Motors, under *Combustion Motors*.

Gas Pumps

The Humphrey Internal Combustion Pump, and Some Proposed Developments. Editorial Comment, with a sketch of developments described by Mr. Humphrey in a recent lecture. 1500 w. Engng—May 23, 1913. No. 42777 A.

Gas Turbines

Baxter's Gas Turbine. Illustrates and describes a type of gas turbine in which the combustion chambers are formed partly in a rotating impact wheel and partly in a closed case within which the impact wheel rotates. 1200 w. Mech Engr—Nov. 29, 1912. No. 38124 A.

The Problem of the Gas Turbine (Le problème de la turbine à gaz). E. Graue. Theoretic and practical studies of some thermic cycles applicable to gas turbines. Diagrams of some of the theories. 9000

Ignition

w. *Rev de Méc*—Dec. 31, 1912. No. 39083. E. + F.

The Outlook and Possibilities for Constant Pressure Gas Turbines for Blast-Furnace Gases by Experiment (Die Ausichten und die Ausführungsmöglichkeit von Gleichdruckgasturbinen für Hoch-ofengas zu Versuchszwecken). Curt Stedefeld. A careful mathematical study of design. Ills. Serial. 1st part. 2400 w. *Zeit f d ges Turbinenwesen*—Feb. 20, 1913. No. 40556 D.

Compressors for Gas Turbines (Ueber Verdichter für Gasturbinen). Wilhelm Gentsch. Principles of operation; some leading types and their working theory. Ills. Serial. 1st part. 1800 w. *Die Turbine*—March 5, 1913. No. 41455 D.

See Internal Combustion Engines, under *Combustion Motors*.

Ignition

Gas Engine Ignition. P. J. Haler and H. T. Wright. Describes trouble with a small engine fitted with tube ignition, and the change to "Lodge" ignition. Ills. 1000 w. *Prac Engr*—Dec. 26, 1912. No. 38872 A.

Ignition from Dry Cells. A. L. Brennan, Jr. Explanatory notes for the inexperienced. 1200 w. *Power*—Jan. 7, 1913. No. 38842.

Causes and Effects of Premature Ignition in Explosion and Combustion Engines (Causes et effets des allumages prématurés dans les moteurs à explosion et à combustion). M. L. Letombe. A study by indicator diagrams of effects and suggestions for remedies. Ills. 6000 w. *Mem Soc Ing Civ de France*—May, 1913. No. 43556 G.

Make-and-Break Igniters. Earl Pagett. Explains some of the peculiarities in its operation. Ills. 1500 w. *Power*—Aug. 5, 1913. No. 44153.

Ignition Point of Internal Combustion Engines. Reginald Trautschold. Discusses the effect on efficiency. 1500 w. *Prac Engr*, Chicago—Oct. 15, 1913. No. 45886.

Automatic and Fixed Ignition Timing in Combustion Motors (Die selbsttätige und feste Zündeneinstellung bei Explosionsmotor). Josef Löwy. Illustrations and description of several German magnetos of both types. 2600 w. *Elek u Masch*—Oct. 5, 1913. No. 46084 D.

See also same heading, under *Automobiles*.

Internal Combustion Motors

Internal Combustion Motors and Gas Producers (Moteurs à Combustion Interne et Gazogènes). Léon Letombe. A comprehensive review, in four parts, divided into suitable chapters, of gas en-

COMBUSTION MOTORS**Oil Engines**

gines, their fuel, design, powers, etc.; gas producers; combustible-liquid engines, and general considerations. Ills. 90 pps. *Tech Mod (Supplement)*—Dec. 15, 1912. No. 39065 H.

Internal Combustion Engines (Motori a combustione interna). Igino Saraceni. Description of the A. E. G. oil engine and the Garuffa gas turbine. Ills. 2000 w. *Industria*—Aug. 10, 1913. No. 45365 D.

Internal Combustion Engines (Motori a combustione interna). E. Garuffa. Some corrective and additional remarks on the Garuffa gas turbines, as previously described by I. Saraceni. 1200 w. *Industria*—Aug. 31, 1913. No. 45367 D.

Lubrication

Lubrication of Gas Engine Cylinders. A. L. Brennan, Jr. Suggestions for the selection and use of oils for cylinder lubrication. 1200 w. *Power*—Jan. 28, 1913. No. 39495.

Manograph

The Manograph. Hugo C. Gibson. Describes the features of the Hospitalier type in particular, and some of the steps in its development, showing the value of the indications obtained. Ills. 2000 w. *S. A. E. Bul*—April, 1913. No. 42341 N.

Oil Engines

Land and Marine Oil Engines. C. Lakin-Smith. Read at the Hardware Exhibition. Considers causes of the popularity of the oil engine and discusses types. 1500 w. *Prac Engr*—Nov. 7, 1912. No. 37621 A.

The Significance of Oil Engine Developments. W. T. Price. From a paper before the Phila. Found. Assn. Illustrates and describes large and small units now being built which are designed to operate with low-grade fuel. 2000 w. *Ir Trd Rev*—Dec. 26, 1912. No. 38537.

Brake Test on a 75-h. p. Oil Engine. A. A. Potter and W. W. Carlson. Report of test made to determine whether the engine would deliver 75 brake h. p. with a fuel consumption of 1.25 pint per brake h. p.-hr. Ills. 800 w. *Elec Wld*—Jan. 11, 1913. No. 38998.

Heavy-Oil Marine Engines (Motore ad olio pesante tipo marino). Enrico Mariotti. Description of operation of the Mariotti engine for marine purposes. Ills. 2800 w. *Industria*—Jan. 5, 1913. No. 39097 D.

Classification of Oil Engines. Oscar P. Ostergren. Explains some of the problems solved in the development of oil engines, and illustrates typical vaporizing and mixing arrangements. Outlines the characteristics of the Diesel engines.

Consult Classification of the Index. See page 9.

Oil Engines

2000 w. Power — Feb. 11, 1913. No. 39758.

Bolinder's Crude-Oil Engine. Illustration, with detailed description of a new machine. 1600 w. Engng—April 18, 1913. No. 41768 A.

The Principles of Fuel Oil Engines. Prof. Hirschfeld. A study of the preparation of the fuels for use in engines, and the problems of operation. 6800 w. Wis Engr—May, 1913. No. 42442 C.

Marine Oil Engines (Schiffsölmashinen). Walter Mentz. A comprehensive study of the several types of engines, their builders and performance on various vessels. Ills. Serial. 1st part. 9600 w. Schiffbau—April 9, 1913. No. 42126 D.

Crude Oil Engines (Ueber Rohölmotoren). F. Weinreb. A review of the theory of oil engines and the types constructed, leading up to the Diesel design. Ills. 4000 w. Elek u Masch—May 25, 1913. No. 43043 D.

The Principles of Fuel Oil Engines. C. F. Hirschfeld. Read before the Am Soc of Agri Engrs. Discusses the chemical and physical basis of their operation. 2500 w. Sci Am Sup—July 19, 1913. Serial, 1st part. No. 43783.

New Heavy-Oil Engine. A. E. Ballin. Illustrated description of the Snow horizontal oil engine, with information related. 1200 w. Power—Aug. 12, 1913. No. 44294.

Test of a Kerosene-Oil Engine. H. D. Wile. Brief report of a test of the Falk kerosene engine carried out at the University of Wisconsin. 700 w. Elec Wld—Aug. 23, 1913. No. 44566.

The A. E. G. Oil Engine. Illustrated detailed description of a new engine for the direct driving of electric dynamos. 1000 w. Mech Engr—Aug. 8, 1913. No. 44452 A.

Description of Nurnberg Two-Cycle 450-B. H. P. Heavy-Oil Engines. Louis Shane. Drawings and description. 4000 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45171 H.

Water-Cooled Clutch and Slipping Gear for Oil-Engine Drives. Illustrated description. 600 w. Engng—Oct. 17, 1913. No. 46246 A.

HEATING AND COOLING

Air Conditioning

The Oil-Motor Industry in Italy. Abstract trans. from *Des Oelmotor*. Review of the development with illustrated description of types. 1500 w. Power—Oct. 7, 1913. No. 45702.

Observations on the Oil Engine. John F. Wentworth. Reviews the development, aiming to show that the Diesel engine is a reproduction of the ideal engine described by de Rochas nearly 50 years ago, and comparing Diesel and Wentworth engines. 3000 w. Power—March 11, 1913. No. 40384.

Two-Stroke Cycle Continuous-Combustion Oil Engines for Ships. Shows two arrangements designed and patented by Messrs. Sulzer Bros. Ills. 1000 w. Mech Engr—Feb. 21, 1913. No. 40313A.

See also Pumping Stations under Civil Engineering, *Water Supply*; Diesel Engines, Combustion Motors, Internal Combustion Engines and Oil Engines under Marine and Naval Engineering; Internal Combustion Engines under *Combustion Motors*; Engines under *Aeronautics*; Engines under *Automobiles* and under *Combustion Motors*. Also, Oil Fuel under Marine and Naval Engineering and Oil Engines under Railway Engineering, *Motive Power and Equipment*.

Producer Gas

The Generation and Distribution of Producer-Gas in South Staffordshire. Herbert Alfred Humphrey. Abstract of a paper read before the Inst. of Civ. Engrs. Explains a scheme for the supply of cheap fuel gas. 3500 w. Engng—Dec. 13, 1912. No. 38524 A.

See also Fuels, under *Steam Engineering*, and Peat, under *MINING and METALLURGY, Coal and Coke*.

Thermal Efficiency

Jacket Water Temperatures and Fuel Consumption in Internal Combustion Engines. Reginald Trautschold. Considers the effect of jacket water temperatures upon fuel consumption. 1200 w. Can Engr—June 19, 1913. No. 42990.

Valves

Valve Movements of Explosion Engines. Drawings and descriptions of recent patents. 1200 w. Prac Engr—Jan. 23, 1913. No. 39780 A.

See also Slide Valves, under *Automobiles*.

HEATING AND COOLING

Acoustics

Air Currents and their relation to the Acoustical Properties of Auditoriums. F. R. Watson. An account of experiments with application of the conclusions to ventilating systems. 5500 w. Eng Rec—March 8, 1913. No. 40369.

Air Conditioning

Humidity and House Sanitation Explained. Observations on tests conducted to discover effects of varying degrees of temperature and humidity on health. 3000 w. Met Work—Jan. 24, 1913. No. 39312.

Consult Classification of the Index. See page 9.

Air Cooling

Temperature and Humidity in Factories. C. E. Winslow. Discusses methods of regulating temperature and air supply and control of humidity in factory installations. 3000 w. *Met Work*—Jan. 24, 1913. No. 39313.

The Relations between the Physical, Physiological and Psychological Aspects of Warming and Ventilation. Arthur H. Barker. Abstract of paper read before the Inst. of San. Engrs. 2500 w. *Archit.*, Lond.—April 11, 1913. Serial. 1st part. No. 41372 A.

Air Conditioning. Shows its application to the industries and considers results obtained. 1200 w. *Wis Engr*—March, 1913. No. 41575 C.

Regulating the Air Conditions in a Glove Steaming Room. Explains the solution of a difficult problem in a Brooklyn, N. Y., Factory. Ills. 1000 w. *Heat & Vent Mag*—April, 1913. No. 41282.

See also Sanitation, under **CIVIL ENGINEERING**, *Municipal*.

Air Cooling

Air-Cooled Jacketing in Hollow Walls by Electric Fans. J. W. Meares. Abstract of a paper read before the Calcutta Sec. of the Inst. of Elec. Engrs. Suggestions for mitigating living conditions in the new buildings at Delhi, India. 1700 w. *Elect'n*, Lond.—Aug. 1, 1913. No. 44308 A.

Air Dryers

Modern Evaporators (Moderni essicatori). Francesco Mauro. General discussion on the uses of cooled dry air, especially in refrigeration. Diagrams. Serial, 1st part. 2800 w. *Industria*—Sept. 7, 1913. No. 45369 D.

Air Ducts

The Design of Air Ducts. L. A. Harding. Gives new charts, based on a lower coefficient of friction as determined by tests, explaining their use. 1800 w. *Heat & Vent Mag*—April, 1913. No. 41283.

Loss of Pressure Due to Elbows in Air Ducts. Frank L. Busey. Read before the Am. Soc. of Heat & Vent Engrs. Gives results of experiments to discover effect of different types of elbows in reducing air pressure in ducts. 2200 w. *Met Work*—Aug. 15, 1913. No. 44435.

See also Dust Collecting, and Ventilating, under *Heating and Cooling*.

Air Washing

Air Washing as a Means of Obtaining Clean Air in Buildings. George C. Whipple and Melville C. Whipple. Tests showing possibilities in washing and recirculating indoor air. 4000 w. *Heat & Vent Mag*—Sept., 1913. No. 45178.

Buildings

Heating and Ventilating Equipment, and Other Mechanical Appliances in the

HEATING AND COOLING**Costs**

New Vienna Bank Co. Building (Die Heizungs- und Lüftungsanlagen und einige andere technische Einrichtungen im Neubau des Wiener Bank-Vereines). Arnold Steiner. Description of entire installation. Ills. 2500 w. *Zeit des Oest Ing u Arch Ver*—March 28, 1913. No. 41474 D.

Central Heating

The Distribution of Central Heating Plants in Towns (Distribution centrale du chauffage dans les villes). A review of practice adopted in America and Europe. 5500 w. *Tech Mod*—Feb. 1, 1913. No. 40066 D.

See also Combination Stations, under **ELECTRICAL ENGINEERING**, *Generating Stations*.

Central Plants

Central Heating in Cities (Die zentrale Beheizung der Städte). H. Strache. A study of the question considering the use of coal gas. 3300 w. *Feuerungs*—June 1, 1913. No. 43034 D.

Central Stations

Economics of Central Station Heating. Byron T. Gifford. (Abstract.) Considers briefly the production of the heat units; the distribution, and the making the service attractive. 1800 w. *Jour Am Soc of Mech Engrs*—Sept., 1913. No. 45419 D.

Cold Storage

Cold Storage and Precooling Fruit. J. L. Hughes. Account of experience in cold storage of strawberries, fruit seeds, nuts, peaches, and apples. 1500 w. *Ice & Refrig*—May, 1913. No. 41891 C.

Combination Plant

Combination Heating in a Large Residence. Describes features of heating system employing warm air and hot water in a 22-room residence. Ills. 1800 w. *Met Work*—Jan. 3, 1913. No. 38748.

Combustion Heating

Features of Combustion Heating in Residence. Illustrates and describes a carefully designed combination warm-air and hot-water system. 3000 w. *Met Work*—June 6, 1913. No. 42673.

Condensing Plants

Condensing Plants for Large Commercial Buildings. Ira N. Evans. Explains the system which can be applied to any height of building. 1500 w. *Power*—Jan. 21, 1913. No. 39241.

Costs

Expense of Operating Heating and Ventilating Plants. H. M. Hart. Studies for computing costs in advance of construction in residences, apartment buildings, schools and office buildings, with typical examples. 3600 w. *Proc Am Soc Heat & Vent Engrs*—July, 1913. No. 43594 N.

Consult Classification of the Index. See page 9.

Country Houses

HEATING AND COOLING

Fans

Country Houses

Heating and Plumbing in Country Home. Illustrated description of a direct and indirect hot-water heating and independent water supply and sewage disposal plants. 2500 w. Met Work—June 27, 1913. No. 43230.

Department Store

Heating and Ventilating Bonwit-Teller Bldg. Drawing and detailed description of the plant. 1200 w. Dom Engrg—March 29, 1913. No. 40946.

District Heating

District Heating by Steam and Hot Water. L. B. Lent. Discusses cost of the two systems and when each is preferable. Gives calculations for sizes of mains and other details. 2500 w. Power—April 29, 1913. No. 41681.

District Steam Heating with High Pressure Steam. Frederick W. Ballard. Aims to show that the advantages incident to low-pressure steam heating from isolated plants will not be found if the distribution is extended over a wide range of territory. Ills. 2500 w. Jour Ohio Soc of Mech, Elec, & Steam Engrs—May, 1913. No. 42446 N.

The Design of Central Heating Systems. A. G. Christie. Considers the advantage of the central heating plant, its utility, location, design, etc. 5500 w. Can Engr—July 17, 1913. Serial, 1st part. No. 43824.

Draft

Forced Draft Control at Ritz-Carlton Hotel. Charles A. Fuller. Illustrated description of the forced draft system installed. 1700 w. Power—Nov. 12, 1912. No. 37376.

Dust Collecting

Specifications for Dust Collecting Systems. Information of a design required by labor law in New York State, with recommendations. 2500 w. Met Work—April 4, 1913. No. 41083.

Electrical Heaters

The Construction of Electrical Heaters. H. O. Swoboda. Illustrates and describes types utilizing the four different ways of changing electricity into heat. 2500 w. Elec Jour—April, 1913. No. 41214.

Electrical Heating

Electrical Heating. Discusses efficiency as applied to electric heating, and the meaning of an ideal heating system, giving report of a test made of a luminous electric radiator. 2000 w. Elec Rev, Lond—June 13, 1913. No. 43129 A.

Efficiency and Cost of Electrical Heating. H. O. Swoboda. Third and concluding article of a series. Considers the four methods of carrying the electrically generated heat to the point where it is

required. 2500 w. Elec Jour—July, 1913. No. 43808.

Electric Heaters in Mechanical Construction (Elektrische Heizung im Maschinenbau). W. Schulz. General description of types of heating surfaces adopted for domestic and factory purposes. Ills. 5000 w. Zeit des Ver deutscher Ing—July 12, 1913. No. 44648 D.

Exhaust Steam

Cost of Exhaust Steam Heating. Ira N. Evans. Shows how more power can be obtained from the same amount of steam before utilizing it in the heating system. 5000 w. Power—Nov. 26, 1912. No. 37785.

Factories

An Unusual Factory Heating Installation. E. Morris Lloyd. Illustrated description of an installation in the De Laval Separator Co.'s factory at Poughkeepsie, N. Y. 1200 w. Dom Engrg—Jan. 18, 1913. No. 39209.

Factory Heating

Operating Economies in Heating Large Factory Buildings. Edward L. Wilder. Directions for the economical operation of heating systems. 1500 w. Heat & Vent Mag—July, 1913. No. 43994.

Fans

Size, Capacity and Power Required for Centrifugal Fans. Frank B. Gilbert, Jr. Diagrams for determining power are given and charts that give the capacity when other factors are known. 500 w. Power—Jan. 21, 1913. No. 39238.

Comparative Tests of Three Types of Turbine-Driven Forced Draft Fans. W. J. A. London. Report of tests carried out at Hartford, Conn., to determine the relative efficiency of three distinctive types of fans when combined with a standard Terry vertical turbine. Ills. 1700 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38294 H.

Turbine-Driven Forced-Draft Fans. Henry F. Schmidt. Discussion of "Comparative Tests of Three Types of Turbine-Driven Forced-Draft Fans," by W. J. A. London. Ills. 2000 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40861 H.

Facts and Theories Relating to Fans. David M. Mowat. Methods of testing exhaust fans and of calculating efficiencies. 7500 w. Col Engr—March, 1913. No. 40276 C.

Power Requirements of Fans, Blowers and Exhausters. C. W. Drake. Gives an outline of various types of apparatus for moving air and a brief description of the characteristics, uses, and limitations of each. Ills. 2500 w. Elec Jour—March, 1913. No. 40871.

Fan Testing

See also Electric Drive, under *Power and Transmission*.

Fan Testing

Measurement of Air in Fan Work. Discussion of Charles H. Treat's paper. 1500 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41301 D.

Foundries

Foundry Heating and Ventilation. W. H. Carrier. From a paper read before the Am. Found. Assn. Discusses the points to be considered in solving the problem. Ills. 1800 w. Ir Age—Nov. 21, 1912. No. 37724 C.

The Heating and Ventilation of the Foundry. W. H. Carrier. Discusses conditions and the features governing the design and selection of the foundry heating and ventilating system. Ills. 2000 w. Am Found Assn—Dec., 1912. No. 38612 N.

Gas Fires

Study of the "Shadowgraph" Test for Gas Fires. W. J. A. Butterfield. Reports investigation of this method of testing the ventilation of gas fires. 5000 w. Gas Wld—Nov. 30, 1912. No. 38110 A.

Recent Progress in Gas Fire Science. H. James Yates. Abstract of paper read before the British Assn. Reviews the evolution of the modern gas fire and discusses the problem of radiation. 1800 w. Archt, Lond—Oct. 3, 1913. No. 45831 A.

Gas Heating

The Hygienic Aspects of Gas for Heating and Lighting in Home, School and Workshop. Vivian B. Lewes. Lecture before the British Commercial Gas Assn. Aims to show that coal gas as now used is hygienic and efficient. 6000 w. Pl & Dec—Nov. 1, 1912. No. 37624 A.

The Possibilities of House Heating by Artificial Gas as a Fuel. A. F. Krippner. Gives results of experiments, investigations, and observations made in St. Louis. 3500 w. Am Gas Lgt Jour—Feb. 10, 1913. No. 39734.

Notes on "Gaseous Heating." E. W. Smith and C. M. Walter. Abstracts of a paper read before the Inst. of Gas Engrs. Discusses the quality of gas best suited for use in heating processes. 4000 w. Mech Engr—June 20, 1913. Serial, 1st part. No. 43378 A.

Coal Gas as a Fuel for Domestic Purposes. F. W. Goodenough. Cantor lecture. Discusses gas as a fuel for the heating of homes. Ills. 8500 w. Jour Soc of Arts—Aug. 15, 1913. No. 44702 A.

Greenhouses

Heating Three Small Greenhouses. N. S. Arthur. Describes heating equipment designed to maintain different tempera-

HEATING AND COOLING**Heating Systems**

ture in greenhouses and hotbeds erected at different times. 2200 w. Met Work—Sept. 5, 1913. No. 44946.

Heat Economy

Methods of Economizing Heat. Charles R. Darling. Discusses mainly the methods at present in use for economizing heat, and the directions in which future improvements may be expected. Ills. 5000 w. Jour Soc of Arts—Jan. 3, 1913. Serial. 1st part. No. 39131 A.

Heaters

Elliott Vertical and Horizontal Heaters. Illustrated description. 2200 w. Power—Aug. 26, 1913. No. 44584.

Heating Problems

Graphical Solutions of Heating Problems. H. J. Thorkelson. Gives a diagram and a circular slide rule, explaining their use. 700 w. Wis Engr—Nov., 1912. No. 38565 C.

Heating Systems

The Hot-Panel and Hot-Floor Border System of Heating. H. Riall Sankey. Read before the Jr Inst of Engrs. Describes an application of this system. Ills. 3300 w. Engng—Jan. 17, 1913. No. 39480 A.

Hot Panel and Floor Border System of Heating. H. Riall Sankey. Read before the Jun. Inst. of Engrs, England. Describes a system originally devised by A. H. Barker, which gave satisfactory results. Diagrams. 4000 w. Met Work—Feb. 28, 1913. No. 40225.

Hot Panel and Hot Floor Border System of Heating. H. Riall Sankey. From a paper before the Jun. Inst. of Engrs, London. Information concerning the effectiveness of this system, describing an installation. Ills. 3000 w. Heat & Vent Mag—May, 1913. No. 42428.

Time Analysis in Starting Heating Apparatus. Ralph C. Haggart. A study of boiler performance curves in relation to the final room temperatures from given initial temperatures. 5000 w. Proc Am Soc of Heat & Vent Engrs—July, 1913. No. 43593 N.

High-Pressure Steam Heating vs. Hot Water By-Product Plant. Ira N. Evans. Discusses the financial possibilities of a vacuum hot water heating system. 4000 w. Power—July 29, 1913. No. 43949.

Erecting Heating Systems Without Plans. Describes a system which enables a fitter to prepare piping at shop ready for erection. 1800 w. Met Work—July 4, 1913. No. 43432.

Physical Action of Steam and Forced Hot-Water Heating Systems. Ira N. Evans. A discussion generally favoring the hot-water system. 3000 w. Power—Aug. 12, 1913. No. 44295.

Consult Classification of the Index. See page 9.

Heat Transmission

Elements of Heating. E. N. Irwin. Discusses heating by air, water, and steam. 2000 w. Power—Oct. 7, 1913. No. 45704.

Heat Transmission

A Technical Research on the Conductivity of Plate-Shaped Materials (Ein Technisches Verfahren zur Ermittlung der Wärmeleitfähigkeit plattenförmiger Stoffe). Richard Poensgen. The results of laboratory tests on flat insulating material of various sorts. Ills. 3600 w. Die Kälte Ind.—Feb., 1913. No. 40515 D.

Heat Transmission With Pipe Coils and Cast-Iron Heaters under Fan Blast Conditions. L. C. Soule. A series of fourteen tests made at the Institute of Thermal Research of the American Radiator Co. Ills. 5100 w. Proc Am Soc Heat & Vent Engrs—July, 1913. No. 43598 N.

The Transmission of Heat Between a Fluid in Motion and a Metallic Surface (La transmission de la chaleur entre un fluide en mouvement et une surface métallique). F. Leprince-Rieuquet. A study of the problem of heat exchange between moving gases and surrounding surfaces. Ills. 7000 w. Tech Mod—July 15, 1913. No. 43584 D.

Hospital Plant

The Service Equipment of the Samaritan Hospital, Troy, N. Y. C. F. Herington. Illustrates and describes an example of advanced practice in heating and ventilation. 2500 w. Eng News—July 17, 1913. No. 43837.

Hospitals

Heating and Ventilating in Greenpoint Hospital. Harold L. Alt. Illustrated description of a new hospital in New York State, provided with the most modern equipment. 2000 w. Dom Engng—Aug. 23, 1913. No. 44598.

Hot Air Heating

See also Combination Plant, under Heating and Cooling.

Hot Blast

Hot Blast Heating for an Ice Skating Rink. Describes a heating plant of unusual interest lately installed in the Winnipeg Horse Show Amphitheater. Line drawings. 2000 w. Heat & Vent Mag—April, 1913. No. 41281.

Hotels

Mechanical Equipment of Stock Yards Inn. Plans and description of the plumbing, heating and refrigeration of this new Chicago hotel. 3000 w. Dom Engng—Jan. 11, 1913. No. 38976.

Heating and Ventilating the Hotel McAlpin. Joseph Graham. Illustrated description of the heating and ventilating system installed. 2800 w. Dom Engng—April 5, 1913. No. 41076.

HEATING AND COOLING**Humidity****Hot-Water Heating**

Forced Circulation in Hot-Water Heating. Charles L. Hubbard. Describes various systems of piping and devices intended to promote fast circulation. Ills. 500 w. Met Work—Jan. 24, 1913. Serial. 1st part. No. 39314.

A Unique Formula for the Proper Action of Hot Water Circulation (Formule unique pour le fonctionnement correct des circulations d'eau chaude). L. Rouquaud. An empiric formula for use in hot water circulating systems. 3000 w. Alliance Industrielle—Jan., 1913. No. 39075 D.

Drop-Feed Hot-Water Heating System. Illustrates and describes features of an installation in a building covering a large area. 1500 w. Met Work—Feb. 7, 1913. No. 39718.

Heating and Ventilating in Toledo Post-Office. Plans and description of the hot-water heating installation. 1500 w. Dom Engng—Feb. 15, 1913. No. 39820.

The Design of Hot-Water Supply Systems to Minimize Corrosion. F. N. Speller. Gives results of an investigation of present practice and the influence of the arrangement of the piping on corrosion. 1200 w. Eng News—Feb. 13, 1913. No. 39858.

Hot-Water Heating Extra-Ordinary. Illustrates and describes successful work under difficulties. 3500 w. Met Work—June 20, 1913. No. 42963.

See also Combination Plant and District Heating, under Heating and Cooling.

Hot-Water Systems

Output from Hot-Water Distributory Systems (Rendement des Installations de Distribution d'Eau Chaude). G. de Grahl. Calculations on circulation and boiler production. Extracted from *Gesundheits-Ingenieur*. Diagrams. 10000 w. Rev de Mecan—Jan., 1913. No. 40589 E + F.

Chart for Determining Size of Pipe for Gravity Hot Water Heating Systems. M. S. Cooley. Method of devising such a chart and detailed explanations of its uses. Chart. 4000 w. Proc Am Soc Heat & Vent Engrs—July, 1913. No. 43597 N.

Houses

Heating and Ventilating Apartment House. Illustrates and describes arrangements in a Fifth Ave. apartment house in New York City. 1500 w. Dom Engng—May 3, 1913. No. 41838.

Humidity

Atmospheric Humidity. John Thompson. Read before the Warwickshire Br. of the Nat. Assn. of Col. Mgrs. Considers means of ascertaining the amount of moisture in the air, effect of humidity,

Consult Classification of the Index. See page 9.

Humidity Regulator

etc. Ills. 3500 w. *Ir & Coal Trds Rev*—Feb. 14, 1913. No. 40138 A.

Experiments on Humidifying Air at the Oliver Wendell Holmes School, Boston, Mass. Charles F. Eveleth. Report of tests that show temperature and humidity must be under close and accurate control. Ills. 3000 w. *Heat & Vent Mag*—Oct., 1913. No. 46297.

Humidity Regulator

A Humidity Regulator. William M. Clark. General description of a new device for determining and regulating humidity. Ills. 2000 w. *Ice & Refrig*—Sept., 1913. No. 44945 C.

Hygiene

The Hygiene of Building. Percy L. Marks. Read before the Inst. of San. Engrs. Considers the site, ventilation, lighting and warming, planning, materials, etc. 3500 w. *Plumb & Dec*—Dec. 2, 1912. Serial. 1st part. No. 38236 A.

Ice-Making

The Largest Ice Making Plant. Illustrates and describes details concerning the 1200-ton ice making system of the Anheuser-Busch Brewing Assn. at St. Louis, Mo. 1200 w. *Ice & Refrig*—Oct., 1913. No. 45900 C.

See also Combination Plants, under **ELECTRICAL ENGINEERING, Generating Stations.**

Ice Plants

A Typical Modern Absorption System Ice Plant. Illustrated description of machinery and equipment in a plant at Birmingham, Ala. 2000 w. *Ice & Refrig*—Nov., 1912. No. 37263 C.

Raw Water Can Ice Making Systems. Samuel Sydney. Brief discussion of various systems. 2800 w. *Power*—Nov. 5, 1912. No. 37275.

New System of Making Clear Can Ice from Raw Water. W. D. Fox. Describes an improved method. 2000 w. *Ice & Refrig*—Aug., 1913. No. 44131 C.

Electrically Driven Raw Water Ice-Making Plant. Illustrated description of a plant at Buffalo, N. Y., explaining the advantages of electric drive. 2500 w. *Ice & Refrig*—Sept., 1913. No. 44943 C.

Electrically Operated Ice Factory at Ottawa, Canada. Illustrated description of a plant for the manufacture of distilled water ice of the highest quality. 1000 w. *Ice & Refrig*—Sept., 1913. No. 44944 C.

Electrically Operated Raw Water Ice Plant in Detroit. Illustrated description of two new 75-ton ice factories with record of performance. 2500 w. *Ice & Refrig*—Sept., 1913. No. 44942 C.

See also Combination Plant, under **ELECTRICAL ENGINEERING, Generating**

HEATING AND COOLING**Pre-Cooling**

Stations, and Refrigeration, under Heating and Cooling.

Indirect Heating

Operating Cost of Indirect Heating Systems. Frank L. Busey and Willis H. Carrier. Abstract of a paper before the Am. Soc. of Heat. & Vent. Engrs. Aims to show that there is a definite relation between the cost of power and cost of apparatus. 1500 w. *Power*—March 18, 1913. Serial. 1st part. No. 40690.

Office Buildings

Heating and Ventilation of Office Buildings. Joseph Graham. Illustrates and describes briefly the installation in the U. S. Rubber Co.'s building. 1200 w. *Dom Engng*—June 7, 1913. No. 42716.

Heating and Ventilation of Office Buildings. Joseph Graham. Illustrates and describes features of the New York Edison Co.'s new building. 1000 w. *Dom Engng*—July 5, 1913. No. 43431.

Pipes

Chart for Determining Size of Pipe for Gravity Hot Water Heating Systems. M. S. Cooley. Gives chart and instructions for its use. 1200 w. *Heat & Vent Mag*—Sept., 1913. No. 45180.

Post-Office

Heating and Ventilating Details of the New York General Post-Office. Describes the equipment of the new structure on Eighth Ave. and 32d St. Ills. 2800 w. *Heat & Vent Mag*—March, 1913. No. 40877.

Heating a Mammoth Post Office. L. B. Marks and J. E. Woodwell. Illustrates and describes features of the mechanical equipment for heating and ventilating the new terminal post office for Greater New York. 1200 w. *Met Work*—April 4, 1913. Serial. 1st part. No. 41082.

Practice

Modern Practice in Heating and Ventilation. Alfred G. King. First of a series of articles explaining various phases of this subject. 1700 w. *Dom Engng*—April 5, 1913. Serial. 1st part. No. 41075.

Lecture Course on Elements of Heating. Charles A. Fuller. First lecture of a series covering principles of heating and ventilation in present-day practice. 1000 w. *Met Work*—March 28, 1913. Serial. 1st part. No. 40941.

Pre-Cooling

Methods of Pre-Cooling Perishable Goods at Loading Stations. B. W. Redfearn. Read before the Cong. of Refrig. Considers the beneficial effects of pre-cooling and the methods. 1400 w. *Ry Age Gaz*—Sept. 26, 1913. No. 45447.

See also Cold Storage, under *Heating and Cooling.*

Consult Classification of the Index. See page 9.

Public Buildings

HEATING AND COOLING

Refrigeration

Public Buildings

Heating New County Court House at New Haven. Illustrates and describes details of heating and ventilating appliances, including air conditioning and automatic control of some temperatures. 2500 w. Met Work—Jan. 3, 1913. No. 387.7.

Steam Loop and Gravity-Return System. J. C. Hawkins. Shows the piping of a steam plant in which the steam loop has taken care of the condensation with good results. 2000 w. Power—June 17, 1913. No. 42861.

Changing a Heating Plant from High to Low Pressure Steam. C. E. Daniell. Describes alterations made. Ills. 1200 w. Heat & Vent Mag—June, 1913. No. 43181.

Radiators

Shunt System of Connecting Radiators. Ira N. Evans. A criticism of articles by L. L. Brewster and by W. L. Durand explaining the action of the shunt system of connecting radiation on hot-water heating apparatus. 1500 w. Power—Oct. 7, 1913. No. 45703.

Refrigeration

Refrigeration by Direct Expansion and Brine Circulation. John Green. Discusses the advantages and disadvantages of the two systems. 1500 w. Power—Nov. 19, 1912. No. 37619.

A Contribution to the Theory of Refrigerating Machines. John H. Grindley. Discusses a new cycle of operations, giving diagrams and tables. 3000 w. Inst of Mech Engrs—Nov. 22, 1912. No. 38135 N.

Refrigeration: Application of CO₂. A. H. Tyler. Summary prepared from a report to the Jun. Inst. of Engrs. 1000 w. Prac Engr—Dec. 12, 1912. Serial. 1st part. No. 38389 A.

Vapor-Compression Refrigerating Machines. J. Wemyss Anderson. Illustrated description of types, their action, applications, etc. 14500 w. Inst of Mech Engrs—Nov. 22, 1912. No. 38131 N.

The Properties of Saturated and Superheated Ammonia. William S. Mosher. Collects the various experimental data on the properties of ammonia, attempting to reconcile these data by means of thermodynamic laws and principles. 8500 w. Jour Am Soc of Mech Engrs—Jan., 1913. No. 39350 D.

Electrical Refrigeration for the Butcher. R. L. Lloyd. Explains its advantages, illustrating and describing machines and giving data from various plants with such installations. 2000 w.

Elec Rev & W Elect'n—Jan. 11, 1913. No. 38977.

The Ice and Refrigerating Plant of the Marzanna Dairy (Die Eis- und Kühl-Maschinenlage der Dampfmolkerei Marzanna). L. Heyn. Describes plant and its operation. Ills. 1600 w. Kälte-Ind—Dec., 1912. No. 39013 D.

Indicating the Ammonia Compressor. Robert H. Karl. Shows why indicators have an important bearing on the economical operation of ice machines. 2000 w. Ice & Refrig—Feb., 1913. Serial, 1st part. No. 39632 C.

Weighing Ammonia to Determine Refrigerating Capacity. Fred Ophuls. Describes in detail the arrangement and gives table and explanation of its use. 2000 w. Power—Feb. 11, 1913. No. 39759.

Ammonia Total Heat Diagram and Its Applications. H. J. Macintire. Explanation for use of diagram and various applications. 2500 w. Ice & Refrig—Feb., 1913. No. 39629 C.

A Model Ice-Making Plant in Kentucky. Illustrated detailed description of a 50-ton ice-making plant at Dayton, Ky. 2000 w. Ice & Refrig—Feb., 1913. No. 39631 C.

Winter Work in Refrigerating Plant. Fred Ophuls. Remarks referring to a simple steam-driven can ice-making plant, though applicable to other installations. 2500 w. Power—March 25, 1913. No. 40797.

Weight of Gas or Vapor Handled by Compressor. Fred Ophuls. Considers the distinction between volume and weight of a gas pumped into a condenser by a compression machine and the difficulty of computing the weight of gas. Gives formula for computing weight from data given by indicator card. 1700 w. Ice & Refrig—April, 1913. No. 41081 C.

Winter Work in a Refrigerating Plant. Fred Ophuls. Remarks on the operation of an ammonia compressor, the importance of proper lubricating oil, the amount of steam required as affected by suction pressure and condenser pressure, etc. 2200 w. Power—April 22, 1913. No. 41567.

Weddel's 25th Yearly Report on the Refrigerated Meat Industry in England and Europe for 1912 (Weddel's 25. Jahresbericht über den Handel mit gefrorenem Fleisch im Jahre 1912 in England und dem Kontinent Europa). Abstract of complete report with tables. Serial. 1st part. 3000 w. Kälte Ind—March, 1913. No. 41433 D.

Air as a Stimulator of Corrosion in Refrigerating Systems. M. B. Smith. Gives results of experiments on the action

Refrigeration

HEATING AND COOLING

Schools

of brines on metals, showing the increased rate of corrosion due to air-saturation. 1200 w. Eng News—May 15, 1913. No. 42092.

The New Main Engines of the C. H. Haake Brewing Co. in Bremen (Die neue Maschinen-Zentrale der C. H. Haake-Brauerei A.-G. in Bremen). Georg Götsche. Details of large ice-making machinery of this plant. Ills. 4400 w. Kälte Ind—April, 1913. No. 42130 D.

The Properties of Saturated and Superheated Ammonia Vapor. G. A. Goodenough and William Earl Mosher. Tables of the properties of saturated ammonia and an extensive table of the properties of superheated ammonia, with a chart by which the usual practical problems of refrigeration may be solved graphically. Univ of Ill, Bul 66—Jan. 27, 1913. No. 42902 N.

Raw Water Ice Plant for Car Icing Station. Description and view of a plant at Alexandria, Va. 2500 w. Ice and Refrig—June, 1913. No. 42616 C.

Causes for Variation in Quality of Distilled Water Ice. Peter Neff. Explanation of some of the causes. 1200 w. Power—July 22, 1913. No. 43845.

Operating on the Flooded System. R. L. Mossman. Explains some of the advantages of the flooded system over the expansion evaporating system. Ills. 1000 w. Power—July 22, 1913. No. 43846.

Fish Freezing and Storage at Cape Cod. Illustrated general description and views of the fish and bait freezing and cold storage plant at Provincetown, Mass. 1800 w. Ice & Refrig—July, 1913. No. 43455 C.

Handling of Dressed Poultry. M. E. Pennington. Illustrates and describes modern methods of killing, chilling, packing, storing and shipping poultry for far distant markets. 2200 w. Ice & Refrig—July, 1913. No. 43456 C.

Refrigeration in Argentina. H. G. Cutler. Illustrated description meat freezing plants, ice factories and allied industries. 2500 w. Ice & Refrig—July, 1913. No. 43457 C.

Figuring Power for Refrigerating Plants. Samuel Sydney. Explanation of the various factors to be considered. 2000 w. Power—Aug. 5, 1913. No. 44154.

Corrosion in Refrigerating Systems. Morgan B. Smith. Discusses corrosion due to galvanic action, and gives combinations which work out well in practice. 2000 w. Power—Aug. 16, 1913. No. 44441.

Mechanical Refrigeration and Ice

Making from a Central Station Point of View. E. F. Tweedy. Shows the opportunity offered by this power used in the building up of the yearly load-factor of a central station. 6000 w. Gen Elec Rev—Aug., 1913. No. 44089 C.

Reversible Absorption Apparatus. Translation from the German, describing a new arrangement of ammonia absorption refrigerating machinery based on the Lorenz "polytropic" cycle. 2500 w. Ice & Refrig—Aug., 1913. No. 44132 C.

Organization for Handling Refrigeration Transportation. J. S. Leeds. Discusses some of the features which such an organization should embrace. 2500 w. Ry Age Gaz—Sept. 26, 1913. No. 45448.

The Development of Refrigerating Industries in the United States (Le développement des industries frigorifiques aux Etats-Unis). E. Gouault. Review of the ramifications of the ice and refrigerating industry and its industrial importance. Ills. Serial, 1st part. 3400 w. Genie Civil—Aug. 2, 1913. No. 45346 D.

Comparative Installation and Operating Costs of a Combined Ice-Manufacturing and Cold-Storage Plant. R. H. Tait and L. C. Nordmeyer. The basis of comparison is a plant having 60 tons capacity of ice per day of 24 hr. and cold-storage capacity of 100000 cu. ft. 1500 w. Power—Oct. 28, 1913. No. 46214.

Indicating the Compressor. Peter Neff. A study of diagrams and suggestions for indicating. 2500 w. Power—Oct. 14, 1913. No. 45816.

See also Engine Diagrams, under *Steam Engineering*.

School Hygiene

Hygienic Equipment of a High School. First of three articles describing remarkably complete heating, ventilating, air-conditioning, vacuum cleaning, and refrigerating systems in the West Philadelphia High School. Ills. 1800 w. Met Work—March 7, 1913. Serial. 1st part. No. 40360.

Schools

The Heating, Ventilating and Plumbing System in the Heiligenberg School in Winterthur (Die Heizung, Lüftung und Badeeinrichtung im Heiligenbergsschulhaus in Winterthur). M. Hottinger. Description of system adopted. Ills. 2400 w. Zeitschr des Ver deutscher Ing—Sept. 28, 1912. No. 37446 D.

Public School Heating and Ventilating. Describes the system in public school No. 46, New York City, as an example of

Consult Classification of the Index. See page 9.

School Ventilation

HEATING AND COOLING

Ventilation

modern methods. 3500 w. Dom Engng—Dec. 14, 1912. No. 38205.

Heating and Ventilation of Mount Vernon High School. Ira N. Evans. Illustrated description of the equipment as designed for a new building. 3000 w. Power—Dec. 24, 1912. No. 38360.

Plumbing, Heating, and Ventilating in the Albany High School. H. L. Alt. Illustrated detailed description. 5000 w. Dom Engng—Dec. 28, 1912. No. 38687.

Sheet Metal Duct Work in Waco High School. Illustrates and describes structural details and design of fan connections, warm air and ventilating ducts. 2000 w. Met Work—Jan. 3, 1913. No. 38749.

Heating and Ventilating Equipment of the Newark Normal School, Newark, N. J. Brief illustrated description of the steam supply, fresh air system, exhaust system, etc. 900 w. Heat & Vent Mag—May, 1913. No. 42429.

See also Ventilation, under *Heating and Cooling*.

School Ventilation

Experiment in Schoolroom Ventilation with Reduced Air Supply Through Individual Ducts. Frederick Bass. An account of experiments conducted in the Jackson school in Minneapolis, including physiological and psychological tests. Ills. 9600 w. Proc Am Soc Heat & Vent Engrs—July, 1913. No. 43595 N.

Shop Systems

Heat and Ventilation in a Large Foundry. Illustrates and describes a fan system with air recirculating arrangements. 1200 w. Ir Age—Feb. 13, 1913. No. 39837 C.

Heating and Ventilating Equipment of Mammoth Automobile Factory. Illustrated detailed description of the provisions for supplying 33,000,000 cu. ft. of tempered and filtered air per hour. 2500 w. Met Work—Jan. 31, 1913. No. 39568.

Steam

See Exhaust Steam, under *Heating and Cooling*.

Steam Heating

Cast-Iron Boiler Heating Plant in Sky-Scraper. Illustrates and describes an unusual example of steam heating in a 16-story building with cast-iron boilers of 200 h. p. rating. 1200 w. Met Work—Jan. 3, 1913. No. 38746.

Some Troubles of Steam Heating Systems. Charles H. Bromley. Discusses vacuum troubles, air-bound coils, air and diaphragm troubles, etc. 2000 w. Power—April 15, 1913. No. 41210.

See also District Heating, under *Heating and Cooling*.

Temperature Control

Automatic Temperature Control in Heating and Ventilating Systems. Describes appliances for automatic regulation, explaining their operation. 1000 w. Builder—Sept. 26, 1913. Serial, 1st part. No. 45725 A.

Temperature Regulators

Automatic Temperature Regulation Discussed. Joseph Graham. Considers the saving effected by temperature control apparatus, illustrating and describing the Johnson system. 1600 w. Dom Engng—Sept. 6, 1913. Serial, 1st part. No. 44963.

Vacuum Heating

Heating and Ventilating Large Buildings. Charles L. Hubbard. Illustrated detailed description of equipment for vacuum heating. 1500 w. Prac Engr, Chicago—Aug. 15, 1913. Serial, 1st part. No. 44421.

Ventilation

A Symposium on Ventilation. Two full papers and other abstracts of papers read at the Int. Cong. on Hygiene and Demography. D. D. Kimball, C.-E. A. Winslow, Y. Henderson and F. S. Lee. Discusses why we should ventilate. 12500 w. Eng News—Nov. 28, 1912. No. 37939.

The Effect of Humidity, Temperature and Barometric Pressure on the Blood-Pressure. B. Raymond Hoobler. Presents facts bearing on this subject, describing experiments. 2000 w. Heat & Vent Mag—Jan., 1913. No. 39533.

High Standard for Gymnasium Ventilation. Illustrated description of ventilation equipment designed to reproduce the freshness of out-door air conditions. 3500 w. Met Work—Jan. 17, 1913. No. 39207.

Proper Openings for a Ventilating Plant, and the Efficiency of Ventilators (Die gleichwertige Öffnung einer Lüftanlage und die Kennlinien eines Ventilators). M. Kloss. Theoretical discussion with experiments at several plants. Curves. 5500 w. Zeit des Ver deutscher Ing—Dec. 28, 1912. No. 39044 D.

Ventilation Equipment of Ritz-Carlton Hotel. Illustrated detailed description. 600 w. Dom Engng—Feb. 8, 1913. No. 39760.

Downward Ventilation in a Rockford, Ill., School House. Clinton E. Beery. A report of comparative observations on rooms heated and ventilated by the new, and the regulations, methods, under the same conditions. Ills. 2500 w. Heat & Vent Mag—March, 1913. No. 40878.

Discussion on Principles of Ventilation. Dr. E. Vernon Hill. Considers

Consult Classification of the Index. See page 9.

Ventilation

modern ideas and describes a system designed to produce intermittent breeze effects. 3500 w. *Met Work*—May 16, 1913. No. 42083.

Loss of Pressure Due to Elbows in the Transmission of Air Through Pipes or Ducts. Frank L. Busey. Results of a series of experiments at the testing plant of the Buffalo Forge Co., considering changes in radius of the elbow, and reductions in the throat of the elbow to the blast area. Ills. 3500 w. *Proc Am Soc Heat & Vent Engrs*—July, 1913. No. 43596 N.

Ventilation System of Hotel McAlpin. Illustrated description of the provisions for supplying an abundance of filtered air. 2500 w. *Met Work*—July 25, 1913. Serial, 1st part. No. 43850.

Experiments in School Room Ventilation with Reduced Air Supply Through Individual Ducts. Frederic Bass. Describes experiments, attempting to control the quality of the air and to so distribute it that each occupant would be conscious of its movement. Ills. 3500 w. *Heat & Vent Mag*—Aug., 1913. No. 44511.

School Ventilation in New York City. G. E. A. Winslow. Reports actual tests in 32 school buildings with varying equipment. 4500 w. *Heat & Vent Mag*—Sept., 1913. No. 45179.

The Primary Physiological Purpose of Ventilation. Theodore Hough. Considers it of first importance to facilitate the maintenance of the constant temperature of the body. 4000 w. *Heat & Vent Mag*—Sept., 1913. No. 45181.

HYDRAULIC MACHINERY**Centrifugal Pumps**

Ventilation Standards and Ventilation Methods. R. C. Carpenter. Explains the problems entering into the work of proper ventilation, discussing the requirements and related subjects. 4000 w. *Jour Assn of Engng Socs*—Sept., 1913. No. 45458 C.

Ventilation of Steam Turbine Engine Rooms. Edgar Knowlton. Cites the growth of typical plants and shows how imperative it is that attention be given to the ventilation of the engine room. Describes the most approved methods. 4000 w. *Gen Elec Rev*—Sept., 1913. No. 44830 C.

Ozone in Ventilation. Milton W. Franklin. Gives history of experiments in connection with expired air, the importance of offensive odors as contaminating factors, considers ozone should not supplant ventilation but be used as an accessory. 3000 w. *Heat & Vent Mag*—Oct., 1913. No. 46300.

Ventilation and Recirculation. Dr. Luther H. Gulick. Explains the ways in which air serves the body, advocates the recirculation, and considers the condition of the air. 2000 w. *Heat & Vent Mag*—Oct., 1913. No. 46298.

See also Acoustics, Fans, Houses and Schools, under *Heating and Cooling*; also Exhaust Systems, under *Machine Work and Foundries*. See also Ventilation, under Marine and Naval Engineering and under Mining and Metallurgy, *Coal and Coke*, and *Mining*.

HYDRAULIC MACHINERY**Accumulators**

The Design of Hydraulic Accumulators. A. Lewis Jenkins. An analysis of plain, differential, steam-hydraulic, and hydro-pneumatic accumulators. Ills. 3000 w. *Am Mach*—Jan. 9, 1913. No. 38942.

Air Lifts

The "Air Lift System." F. W. Schmidt. Illustrated explanation. 1500 w. *Yale Sci M*—Jan., 1913. No. 39505 C.

Air Lift Pumping. Charles A. Hirschberg. Considers the points of merit of this system, its uses, describes a test, and various plants. Ills. 3500 w. *Compressed Air*—May, 1913. No. 42420.

High-Duty Air-Lift Water Plant. C. F. Ivins. Illustrated discussion of the system with results of a practical test. 3000 w. *Prac Engr*, Chicago—Oct. 15, 1913. No. 45885.

Air Pumps

Comparative Tests on Water-Jet Air Pumps (Vergleichende Untersuchungen

an Wasserstrahl-Luftpumpen). Herr Grunewald. Efficiency comparison of nine types. Ills. Serial. 1st part. 3000 w. *Zeitschr des Ver deutscher Ing*—Dec. 7, 1912. No. 39032 D.

Researches on the Conditions of Flow in the Ascending Pipes of Compressed-Air Water Lifts (Untersuchungen über die Strömungsvorgänge im Steigrohr eines Druckluftwasserhebers). K. Hoefer. A study of the principles of air pumps. Ills. 7000 w. *Zeit des Ver deutscher Ing*—July 26, 1913. No. 44656 D.

The Gaede Molecular Air-Pump. Illustrated description of a novel rotary pump, explaining its working. 2500 w. *Engng*—Sept. 19, 1913. No. 45568 A.

See also Condensers, under *Steam Engineering*.

Centrifugal Pumps

Some Features of Modern Centrifugal Pump Installations. Describes piping and valve arrangements by means of

Consult Classification of the Index. See page 9.

Centrifugal Pumps

HYDRAULIC MACHINERY

Gas Pumps

which two or more centrifugal pumps may be operated singly, in parallel, or in series. Ills. 1500 w. Engng & Con—Nov. 20, 1912. No. 37702.

Centrifugal Pump Specifications. Chas. A. Carpenter. Shows the importance of stating the service conditions the pump is expected to meet. 1500 w. Engineering Magazine—Dec. 1912. No. 37790 B.

Reliability in High-Lift Centrifugal Pumps. W. E. W. Millington. Read before the Manchester Assn. of Engrs. Deals with points which aim at securing reliability in the design, installation and running of this type of pump. Ills. 6000 w. Mech Engr—Nov. 1, 1912. No. 37394 A.

Test of a Worthington Centrifugal Turbine-Driven Feed Pump at the Naval Engineering Experiment Station, Annapolis, Maryland. Illustrated description of the machine, with account of test made to determine the general performance. 7000 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38299 H.

Calculations on Centrifugal Pumps (Berekening van de centrifugaalpomp). P. F. A. von Wolzogen Kühr. Mathematical discussion. Diagrams. 5500 w. De Ingenieur—Nov. 9, 1912. No. 38475 D.

Operating Conditions in Centrifugal Pumps (Darstellung der Betriebsvorgänge bei Kreiselpumpen). H. A. Jansen. Curve diagrams illustrating the action of the pumps. 4000 w. Zeitschr des Ver deutscher Ing—Nov. 23, 1912. No. 38450 D.

A New Design of Centrifugal Dredging Pump. H. S. New. Illustrates and describes a dredging pump with volute runner and renewable parts. 1700 w. Eng News—Jan. 2, 1913. No. 38781.

Calculations on Centrifugal Pumps (Berekening van de centrifugaalpomp). F. K. Th. van IJsteron. Additional theory suggested by a previous article written by P. F. A. von Wolzogen Kühr. Ills. 1800 w. De Ingenieur—Dec. 7, 1912. No. 39058 D.

High-Pressure Centrifugal Pumps for Fire Engines (Pompes centrifuges à haute pression employées comme pompes à incendie). Description of pumps built by Sulzer Bros. especially adapted to motor fire trucks. Ills. Serial. 1st part. 3600 w. Bull Tech d l Suisse Romande—Jan. 10, 1913. No. 39066 D.

Motor-Driven Centrifugal Pumps. E. C. Wayne. Considers the characteristics of the apparatus, capacity and head, power requirements, types of motors, etc. Ills. 2500 w. Elec Jour—March, 1913. No. 40870.

The Sulzer Bore-Hole Centrifugal Pump

(Die Sulzer-Bohrloch-Kreiselpumpen). Werner Ahrens. Details of pump for deep-well service. Ills. 4200 w. Zeit des Ver deutscher Ing—March 1, 1913. No. 40544 D.

Two-Stage Centrifugal Pump. Illustrated description of a pump made in Manchester, Eng., consisting of a suction cover, a middle body, a delivery cover, and a whirlpool chamber. 1400 w. Engr, Lond—April 25, 1913. No. 41934 A.

Flow Conditions in Centrifugal Pumps (Strömungsverhältnisse in Kreiselpumpen). M. Vidmar. Studies, experiments and formulas for discharge calculations. Diagrams. 3600 w. Serial. 1st part. Zeit f d ges Turbinen—April 10, 1913. No. 42152 D.

Centrifugal Pumps for Irrigation. C. F. Braun. Describes features which make the centrifugal pump a highly efficient and very reliable unit. Ills. 5000 w. W Engng—Aug., 1913. No. 44389 C.

Centrifugal Pumps for Fire Engines on Land and Bilge Duty on Sea (Kreiselpumpe im Dienste von Feuerlösch- und Lenzbetrieben zu Lande und zu Wasser). Herr Klanke. Connections and power of these pumps in such service in conjunction with combustion motors. Ills. 1300 w. Motorwagen—June 30, 1913. No. 44663 D.

The Development of Balancing Devices for Centrifugal Pumps. Alex. V. Mueller. Discusses the problem of caring for the axial thrust of shaft, explaining its cause, and describing the devices and arrangements originated. Ills. 3500 w. Eng News—Sept. 11, 1913. No. 45069.

Sulzer Bore-Hole Centrifugal Pumps. Illustrated description of this type and statement of the advantages claimed. 3000 w. Ir & Coal Trds Rev—Aug. 29, 1913. No. 45047 A.

A Study of Centrifugal Pumps (Étude sur les pompes centrifuges). L. Bergeron. The derivation of an equation suitable to the study of all classes of centrifugal pumps. Ills. 5000 w. Tech Mod—Aug. 15, 1913. No. 45337 D.

A New Centrifugal Pump with Helicoidal Impeller. C. V. Kerr. Gives reason for seeking a new type of pump, a brief treatment of the mathematical theory of the new type, and detailed description. Ills. 7000 w. Jour Am Soc of Mech Engrs—Oct., 1913. No. 46141 D.

See also Pumps, under *Hydraulic Machinery*.

Gas Pumps

A Large Gas Pump Installation. Brief illustrated description of the Chingford reservoir pumping station for the supply

Consult Classification of the Index. See page 9.

Hydraulic Gears

of London. 1500 w. Min & Sci Pr—June 28, 1913. No. 43399.

The Humphrey Pump (Die Humphrey-Pumpe). W. G. Noack. Part 1 discusses the theoretical operation of this gas pump. Diagrams. Serial, 1st part. 6600 w. Zeit des Ver deutscher Ing—June 7, 1913. No. 43524 D.

See same heading, under *Combustion Motors*.

Hydraulic Gears

10,000-H. P. Föttinger Hydraulic Transmission Gear. Illustrated description of an installation put down at the Vulcan Works, Hamburg, to ascertain the efficiency of a high-power machine of the same type. 1000 w. Engng—Dec. 13, 1912. No. 38519 A.

Hydraulic Press

Horizontal Hydraulic Cotton Baling Press. Illustrated description of a new type designed by Arthur E. Cummins. 800 w. Engr, Lond—Jan. 3, 1913. No. 39170 A.

The Single-Cylinder Hydraulic Forging Press (Ueber die reinhydraulischen einstufigen Schmiedepressen). Wenzel Macka. Continuation of a series of articles begun in 1911, descriptive of the design and operation of one-cylinder presses. Ills. Serial. 1st part. 2200 w. Oest Zeit f Berg Hüttenwesen—Dec. 7, 1912. No. 39002 D.

Hydraulics

Impulses in Circular Flow (Der Energie-Satz der kreisenden Flüssigkeit). Donát Bánki. A study of hydraulic action occurring from the intermittent discharge of turbines, centrifugal pumps, and other discharges. Ills. 4400 w. Zeitschr des Ver deutscher Ing—Jan. 4, 1913. No. 40036 D.

Hydraulic Transmission.

Power Transmission by Oil. R. Douglas-Vickers. Illustrated description of the Hale-Shaw hydraulic transmission system recently developed in England. 2500 w. Horseless Age—April 9, 1913. No. 41159.

Hydrodynamics

The Laws of Flow with Regard to Fluidity and Friction (Die Gesetze der Flüssigkeitsströmung bei Berücksichtigung der Flüssigkeits- und Wandreibung). Victor Kaplan. Graphic studies on hydrodynamic theories. 7000 w. Zeitschr des Ver deutscher Ing—Sept. 28, 1912. No. 37441 D.

Hydrometry

The Royal Italian Hydrometric Testing Station in Santhia, Italy (Die königlich italienische hydrometrische Versuchsanstalt in Santhia, Provinz Novara, Italien). G. Mazzini. The layout and equipment of

HYDRAULIC MACHINERY**Pumps**

the station for experimental work. Ills. Serial, 1st part. 1400 w. Turbine—Sept. 5, 1913. No. 46061 D.

See also Laboratories, under *CIVIL ENGINEERING, Measurement*.

Instruction

The Instruction of Hydraulics in Technical High Schools (Ueber den Unterricht in Hydraulik an technischen Hochschulen). Outlines the principles of such instruction. Ills. Serial. 1st part. 3000 w. Die Turbine—Nov. 20, 1912. No. 38461 D.

Nozzles

Some Suggested Errors in Nozzle Experiments. Discusses suggestions given in Prof. J. B. Henderson's paper to Inst. of Mech. Engrs. and opinions of other experimenters. 3500 w. Engng—Jan. 10, 1913. No. 38256 A.

Pipe Fittings

Formulae for Weights of Cast Tees and Crosses. Gives formulae for equal and for unequal diameters. Ills. 900 w. Eng Rec—Aug. 30, 1913. No. 44893.

Pumping Engines

Sewage-Pumping Plant for the Melbourne and Metropolitan Board of Works. Illustrated description of a set of triple-expansion pumping engines of the inverted type. 1000 w. Engng—Nov. 15, 1912. No. 37825 A.

Water Pressure Driven Pumping Engine. Illustrated description of a direct-acting water-pressure pumping engine for pumping chalk deposits at waterworks near Watford, Eng. 1200 w. Engr, Lond—Jan. 24, 1913. No. 39812 A.

Pumping Machinery

Modern Pumping Machinery for Drainage of the Fens. Richard W. Allen. Deals particularly with the vertical steam-engines driving horizontal-spindle centrifugal pumps, and the horizontal oil engines. Ills. 3000 w. Inst. of Mech Engrs—July, 1913. No. 44459 N.

Pumping Plant

Diesel Engine Pumping Station at the Gladstone Dock, Liverpool. Illustrated description of a plant remarkable for its size and for having the pumps driven by internal combustion engines. 1600 w. Engng—Sept. 12, 1913. No. 45401 A.

Pumps

Large Humphrey Pumps for Chingford and Egypt. Illustrated detailed description. 2000 w. Engng—Dec. 13, 1912. No. 38518 A.

The Turbine Pump (Le Pompe-Turbine). Carlo Solari. Reviews underlying principles, and construction features of various pumps. Ills. Serial. 1st part. 4800 w. Monit Tec—Nov. 30, 1912. No. 38498 D.

Pumps

Booster Pumps. H. E. Cole. Abstract of paper and discussion before the Central States W. Wks. Assn. Considers three kinds of consumption requiring booster service. 3000 w. Can Engr—Jan. 16, 1910. No. 39383.

Some New Types of Centrifugal and Turbine Pumps. Illustrates and describes new types designed for various duties on land and water. 2500 w. Col Guard—Jan. 3, 1913. No. 39153 A.

Modern Electrically-Driven Water Appliances at the Maffei-Schwartzkopf Works (Moderne elektrisch betriebene Wasserhaltungen der Maffei-Schwartzkopf-Werke). Leo Falk-Wildau. Describes high-pressure centrifugal pumps, sinking pumps, etc., to be electrically operated. Ills. 2600 w. Elek Kraft u Bahnen—Dec. 14, 1912. No. 39051 D.

The Humphrey Pumps at Chingford. Gives illustrations showing in detail the arrangement and construction of the plant, with description. Plate. 2500 w. Engng—Feb. 14, 1913. No. 40130 A.

The Oddie "Simplex" Feed-Pumps and Air-Pumps. Illustrates and describes two types of pump fitted with "Simplex" valve-gear. 2500 w. Engng—Jan. 31 1913. No. 39801 A.

The "Stereophagus" Pump. Describes a new pump, designed by R. C. Parsons, which, by means of a knife blade, cuts up solids which are passed into it. Ills. 1100 w. Elect'n, Lond—Jan. 31, 1913. No. 39778 A.

Steam Fire and Salvage Pump. Illustrated description of pumps recently installed on H. M. tug "Dromedary" for use in Portsmouth Harbor. 600 w. Engng—May 9, 1913. No. 42289 A.

Recent Activity in the Explosive Pump Art. Illustrates and describes recent patents of interest. 2500 w. Sci Am—May 31, 1913. No. 42523.

Design and Operating Features of Motor-Driven Pumps. Charles A. Carpenter. Discussion of laws for centrifugal pumps of homologous design with accompanying curves, examples, etc. 1000 w. Elec Wld—June 14, 1913. No. 42842.

Axial Pumps (Ueber Axialpumpen). Herr Wagenbach. Their difference from radial pumps, and a study of the general relation between the number of revolutions, the quantity of water, and the working head. Ills. Serial. 1st part. 2200 w. Zeit f d ges Turbinenwesen—June 10, 1913. No. 43037 D.

The Oddie-Simplex Steam Pump Built by the Odessa Machine Works, Oschersleben (Die Oddie-Simplex-Dampfmaschine der Maschinenfabrik Odessa, Oschers-

HYDRAULIC MACHINERY

leben). Ernst Preger. Description of the action of this new pump for use with air, water or steam. Ills. 2400 w. Die Turbine—June 5, 1913. No. 43035 D.

The Theory of Centrifugal Pumps. R. L. Daugherty. Explains the various divisions of head entering into the operation of a centrifugal pump, and the characteristics of both turbine and volute pumps. Ills. 2500 w. Power—July 15, 1913. No. 43697.

Functions and Design of Air Chambers. Charles G. Richardson. Describes the essential features of properly designed and located air chambers, with suggestions on charging chambers with air. Ills. 2500 w. Power—July 8, 1913. No. 43492.

Turbine Pumps Built by C. H. Jaeger & Co. (Der Turbinenpumpenbau von C. H. Jaeger & Co.). H. Mitter. Illustrated description of the pumps put out by this Leipzig firm, with detailed plans. Serial, 1st part. 3600 w. Zeit des Ver deutscher Ing—June 28, 1913. No. 43533 D.

The Form of Pump Suction Chambers. An account of investigations made at the works of W. H. Allen, Son & Co., Ltd. 1500 w. Engr, Lond—July 25, 1913. No. 44188 A.

See also Pumping Stations, under CIVIL ENGINEERING, *Water Supply*, and Drainage, under Civil Engineering, *Construction*.

Reciprocating Pumps

Reciprocating Pump Curves. A. M. Daniels. Description of the construction and use of curves for determining the size of reciprocating pumps required under given conditions. 1200 w. Power—April 8, 1913. No. 41126.

Riveters

Riveters or Presses with Hydraulic Levers (Nietmaschine oder Presse mit Druckwasser-Uebersetzung). Herr Brzoska. Operating under slightly different principles from the usual hydraulic press. Ills. 2200 w. Zeit f Werkzeug—Oct. 5, 1912. No. 37463 D.

Turbine Bearings

Thrust Bearings for Vertical Shaft Water Turbines. H. H. Hageman. Considers two general types—one in which the bearing lubricant is under low pressure, and one under high pressure. 1500 w. Sib Jour of Engng—May, 1913. No. 42418 C.

Turbine Blades

The Two-Dimensional Turbine Theory with Particular Reference to Water Friction and its Application and Results on Blade Construction (Die Zweidimensionale Turbinentheorie mit Berücksichtigung

Turbine Discs

ler Wasserreibung und deren Anwendung und Ergebnisse bei Schaufelkonstruktionen). Victor Kaplan. Mathematical discussion. Serial. 1st part. Ills. 4000 w. Zeit f d Ges Turbinenwesen—Dec. 10, 1912. No. 39046 D.

The Construction of Francis Blades According to the Lorenz Turbine Theory, and Their Characteristics (Die Konstruktion der Francis-Schaukel nach der Lorenzschen Turbinentheorie und ihre Eigenschaften). Herr Bauersfeld. Mathematical considerations of the Lorenz theories of stream flow in turbine wheels. Diagrams. 7100 w. Zeitschr des Ver deutscher Ing—Dec. 21, 1912. No. 39037 D.

Blade Faces of High-Pressure Free-Jet Turbines (Die Schaufelflächen der Hochdruckfreistrahlturbinen). H. Brandisch. Studies on the design of spoon-blades for Pelton wheels. Ills. 1800 w. Zeit f d Ges Turbinenwesen—Aug. 20, 1913. No. 46065 D.

Turbine Discs

Distribution of Strains in Rotating Discs of Variable Thickness (Ueber die Berechnung der Spannungsverteilung in rotierenden Scheiben mit veränderlicher Breite). Theodor Pöschl. Mathematical formulae for the determination of necessary thickness in turbine discs. Diagrams. 2000 w. Serial. 1st part. Zeit f d Ges Turbinenwesen—Feb. 20, 1913. No. 40557 D.

Turbine Intakes

Design and Construction of Concrete Suction pipes (Berechnung und Konstruktion von Beton-Saugrohren). Theodor Käch. Formulae for stream-line intakes. Diagrams. 1200 w. Zeit f d Ges Turbinenwesen—Aug. 20, 1913. No. 46066 D.

Turbine Pumps

Axial Thrust in Turbine Pumps and the Methods of Balancing Same. A. E. L. Charlton and L. W. Weil. Describes briefly the origin, nature and effect of axial end thrust in turbine pumps, and discusses the design and application of various balancing devices. Ills. 2000 w. Engng—Aug. 22, 1913. No. 44917 A.

Turbines

10,000 Horse-Power High Pressure Turbines. Biaschina Power Station. Illustrated description of this hydro-electric station in Switzerland. Plate. 1000 w. Engr, Lond—Nov. 8, 1912. No. 37645 A.

The Water Wheels at Keokuk, Iowa. Illustrates and describes the 10,000 h. p. single runner Francis turbines with modified scroll case settings molded in solid concrete. Plate. 2500 w. Eng Rec—Nov. 16, 1912. No. 37580.

Some Points Relative to the Modern

HYDRAULIC MACHINERY**Turbines**

Hydraulic Turbine (Alcuni argomenti relativi alle moderne turbine idrauliche). G. Belluzzo. A summary of the physical and mechanical characteristics of the Francis turbine and derived types. Ills. Serial. 1st part. 3600 w. Monit Tecnico—Dec. 30, 1912. No. 39095 D.

Recent Contributions to the Study of "American" and Inward-Flow Turbines (Nouvelle contribution a l'étude des turbines américaines et centripètes). E. de Morsier. A study of the Hercules inward-flow turbine as manufactured by the Holyoke Machine Co. Ills. 5500 w. Rev de Mecan—Nov., 1912. No. 39067. E. + F.

Hydraulic Turbines with Syphon Intakes (Wasserturbinen mit Hebereinlauf). Fritz Oesterlen. A recent improvement in turbine installation. Ills. Serial. 1st part. 2000 w. Zeit f d Ges Turbinenwesen—Feb. 28, 1913. No. 40555 D.

Some Recently Constructed Turbines (Alcune delle più recenti installazioni di turbine). Details of recent hydraulic turbine installations by A. Riva & C., Milan. Ills. Serial, 1st part. 1500 w. Industria—Jan. 26, 1913. No. 40609 D.

1900-H.P. Water-Turbines for Rio de Janeiro. Illustrated description of turbines recently supplied to the Pirahy power station. 1500 w. Engng—April 11, 1913. No. 41390 A.

Efficiency Test of 6000-H.P. Turbines of the Appalachian Power Company. Report of tests of waterwheels in Development No. 2 on the New River, Virginia, showing them to be remarkably efficient. Ills. 2000 w. Elec Wld—March 29, 1913. No. 40950.

Experiment on the Becher Turbine (Versuche an Becherturbinen). Ernst Reichel and W. Wagenbach. A series of experiments to determine the efficiency of this water-jet turbine. Ills. Serial. 1st part. 3000 w. Zeit des Ver deutscher Ing—March 22, 1913. No. 41461 D.

Turbine Plant for the Carl Zeiss Co. in Jena at Burgau on the Saale (Die Turbinenanlage der Firma Carl Zeiss in Jena bei Burgau a. d. Saale). V. Gelpé. Details of large hydraulic turbine installations. Ills. Serial. 1st part. 3000 w. Zeit des Ver deutscher Ing—April 12, 1913. No. 42136 D.

Vertical Shaft Single Runner Hydraulic Turbines as Applied to Low Heads. H. Birchard Taylor. Gives interesting data pertaining to tests. Predicts that in the future the single runner vertical wheel will be used almost exclusively for low heads. Ills. 3500 w. Gen Elec Rev—June, 1913. No. 42586 C.

A Large High-Speed Turbine (Eine

Consult Classification of the Index. See page 9.

Turbine Speed

MACHINE ELEMENTS AND DESIGN

Ball Bearings

grosse Schnellläuferturbine). H. Thomas. Description of large hydraulic turbine built for a power plant in Brazil. Ills. 1700 w. Zeit des Ver deutscher Ing—July 12, 1913. No. 44650 D.

Niagara Falls Power Company's New Turbines. Illustrated description of the ten 5500 h. p. waterwheels with 54-inch diameter runners and cylinder gate speed control. 1200 w. Eng Rec—Oct. 18, 1913. No. 45944.

See also Rotary Machines, under *Machine Elements and Design*.

Turbine Speed

The Choice of Velocity Diagrams for Francis Turbines (Ueber die Wahl der Geschwindigkeitsdiagramme von Francis-Turbinen). K. Körner. Mathematical discussion. Diagrams. 4400 w. Zeitschr des Ver deutscher Ing—Oct. 26, 1912. No. 37451 D.

Turbine Wheels

Photographic Studies of a Pelton Wheel (Photographische Untersuchungen an einen Peltonrade). R. Katzmayer. Studies on stream flow characteristics. Ills. 1300 w. Zeit f d ges Turbinenwesen—Jan. 10, 1913. No. 40065 D.

Valves

Electrical Operation of Large Valves (La commande électrique des grandes vannes). H. Gil. Describes several types of electrically-operated valves for water-gates, steam ports, etc. Ills. 3600 w. Genie Civil—Aug. 16, 1913. No. 45348 D.

Water Ram

An Experience with Water Ram Resulting from the Operation of a Hydraulic Elevator at Northeast Harbor, Maine. From a paper by Charles W. Sherman, before the N. Eng. W. Wks. Assn. Describes physical conditions and explains the cause of the trouble. 1200 w. Engng & Con—Jan. 29, 1913. No. 39582.

Water Wheels

Large Water Wheels for Keokuk Power Plant. Illustrates and describes the method of molding and casting. 1500 w. Ir Trd Rev—Feb. 13, 1913. No. 39843.

The Turbines of the Keokuk Power Plant. Chester W. Larnier. Illustrates and describes the designs, the transporting and erecting problems of the 10,000 h.p. units of the 300000 h.p. development of the Mississippi River. 3000 w. Ir Age—March 13, 1913. No. 40632 C.

Test of a Steel Overshot Water Wheel. C. R. Weidner. Illustrated report of tests on a 10-ft. wheel at the hydraulic laboratory of the Univ. of Wisconsin. 2500 w. Eng News—Jan. 2, 1913. No. 38783.

Theory and Test of an Overshot Water Wheel. Carl Robert Weidner. Describes experiments undertaken to obtain information as to performance, and to secure data which would aid in designing a wheel. Ills. 136 pp. Bul Univ of Wis—No. 529. No. 43761 N.

See same heading, and Bearings, under *ELECTRICAL ENGINEERING, Generating Stations*.

MACHINE ELEMENTS AND DESIGN

Alignment

The Alignment of Machinery. William Sinclair. Read before the Engng. Assn. of N. S. W. Illustrates and describes methods used. 1500 w. Aust Min Stand—July 17, 1913. Serial, 1st part. No. 44471 B.

Lining a 4-Bar Guide. F. W. Bentley, Jr. Describes how to do this accurately with tools improvised in the engine room. Ills. 1800 w. Prac Engr, Chicago—Aug. 15, 1913. No. 44420.

Ball Bearings

Making New Departure Ball-Bearings. Chester L. Lucas. Illustrates and describes machining and gaging methods employed in producing the "two-in one" bearing. 3000 w. Mach, N Y—Nov., 1912. No. 37160 C.

The Design of Ball Bearings. Franz J. Jarosch. Prepared for the Soc. of Auto Engrs. Discusses the work of balls and ball raceways in radial and thrust ball bearings with respect to friction and load

relations. Ills. 2000 w. Ind Engng—Jan., 1913. Serial, 1st part. No. 38816 C.

The Work of Balls and Ball Raceways in Radial and Thrust Ball Bearings with Respect to Friction and Load Relation. Franz J. Jarosch. Considers the location of ball raceways, the form, the travel of balls in their races, load distribution, permissible loads, etc. Ills. 5500 w. S A E Bul—Nov., 1912. No. 38569 N.

Ball-Bearing Design. Frederick G. Hughes. Critical review of the paper on "The Work of Balls and Ball Raceways in Radial and Thrust Ball Bearings with Respect to Friction and Load Relations," by Franz J. Jarosch. 4000 w. S A E Bul—April, 1913. No. 42335 N.

Ball Bearings—Their Construction and Application. Considers the advantages of ball bearings and their application on industrial equipment. Ills. 1800 w. Mach, N. Y.—July, 1913. No. 43366 C.

Some Historical Notes on the Development of the Ball Bearing. An account of

Bearings

early endeavors to find forms of ball bearings for different purposes. 1500 w. *Horseless Age*—July 16, 1913. No. 43750.

The Manufacture of Balls for Bearings. Thomas J. Heller. Describes methods which produce balls true to within one ten-thousandth of an inch. Ills. 2000 w. *Sci Am Sup*—Aug. 9, 1913. No. 44217.

Notes on the Use of Ball Bearings in Street Cars (Ein Beitrag zur Verwendung von Kugellagern bei Strassenbahnen). W. Bethge. Results of their use in the axles of some German cars. Ills. 2200 w. *Elek Kraft u Bahnen*—Aug. 24, 1913. No. 46085 D.

Bearings

Making Annular Bearings. Robert H. Grant. Illustrates and describes machinery and methods employed in the manufacture. 2000 w. *Mach, N Y*—Dec., 1912. No. 37982 C.

Roller and Ball Bearings. John Goodman. Reports an investigation made to find out the load and speed at which such bearings may be allowed to run. Ills. 49 pp. *Inst of Civ Engrs*—No. 3967. No. 39300 N.

The Testing of Antifriction Bearing-Metals. John Goodman. Report of tests made, methods, apparatus, etc., with discussion and correspondence. 38 pp. *Inst of Civ Engrs*—No. 3969. No. 39301 N.

High-Speed Bearings. John C. K. Bal-fry. Read before the Rugby Engrng. Soc. Illustrated discussion of bearings and their lubrication, and related topics. 5000 w. *Mech. Engr*—Feb. 7, 1913. No. 39911 A.

The Use of Roller and Grooved Ball and Roller Bearings in Machine Tools (Emploi des roulements et des coulisse-ments à billes et à galets dans les machines-outils). P. Gorgeu. Illustrates and describes best arrangements. 3000 w. *Tech Mod*—Jan. 15, 1913. No. 40065 D.

Water Wheel Thrust Bearing. Illustrates and describes a thrust bearing of the oil pressure type, designed by Albert Kingsbury and installed at McCall Ferry hydroelectric plant. 1200 w. *Eng Rec*—Jan. 11, 1913. No. 38957.

A Thrust Bearing for High Unit Pressures. Illustrated description of the Kingsbury thrust bearing, designed to distribute the load uniformly and to keep the surfaces separated by a film of oil. 1000 w. *Am Mach*—March 13, 1913. No. 40424.

The Kingsbury Thrust Bearing. W. W. Smith. Illustrates and describes these bearings as fitted on the turbines of the U. S. S. *Neptune* and report of

MACHINE ELEMENTS AND DESIGN

Design

results. Ills. 3500 w. *Jour Am Soc of Nav Engrs*—Nov., 1912. No. 38293 H. Ball-Bearing Design. Frederick G. Hughes. Discussion of Franz J. Jarosch's paper, questioning deductions set forth. Ills. 2000 w. *Horseless Age*—May 28, 1913. Serial. 1st part. No. 42631.

Study of Bearing Metals and Testing Methods. T. D. Lynch. Read before the Am. Soc. for Test. Mat. Gives results of an investigation of tin-base and lead-base bearings, with details on melting and pouring babbitt metals. Ills. 2500 w. *Foundry*—July, 1913. No. 43415.

The Development of Lathe Headstock Bearings. Hubert Bentley. Illustrates and describes four stages of the development. 1000 w. *Mech Wld*—June 20, 1913. No. 43380 A.

The Development of Line-Shaft Bearings. Hubert Bentley. Discusses one example in each of the four classes of journal bearings. Ills. 1200 w. *Mech Wld*—Aug. 22, 1913. No. 44913 A.

See also same heading, under *Automobiles*, and same heading, under *STREET AND ELECTRIC RAILWAYS*.

Brakes

Differential Compound Band-Coupling (Differential Verbund Bandkupplung). Otto Ohnesorge. A study of band-brakes in machine design. Ills. 2500 w. *Zeit des Ver deutscher Ing*—June 28, 1913. No. 43535 D.

Cams

Dynamics of Gas Engine Cams. M. Terry. Investigates the relative merits of different types of cams. Ills. 6000 w. *Mach, N Y*—Nov., 1912. Serial. 1st part. No. 37163 C.

The Design of Cams for Flat Face Tappets. H. B. Heign. Gives a new method for determining the radius of curvature of the inclines of cams for mushroom tappets. Diagrams. 1000 w. *Horseless Age*—Nov. 27, 1912. No. 37927.

A Note on Cam Roller Clearances. Discusses the effect a large cam roller clearance has on the engine. Ills. 1200 w. *Engr, Lond*—Feb. 28, 1913. No. 40490 A.

Connecting Rods

A Study of the Action of Connecting Rods (Etude du Mouvement d'une Bielle). P. Massot. Mathematical calculations. Ills. 8000 w. *Rev de Mecan*—Oct. 31, 1912. No. 37504 E + F.

Design

Appearance in Design as Affected by Function. D. S. Kimball. Calls attention to the relation between mechanical efficiency and mechanical proportions, and

Consult Classification of the Index. See page 9.

Dies**MACHINE ELEMENTS AND DESIGN****Gears**

the aesthetic quality. Ills. 1200 w. Sib Jour of Engrg—June, 1913. No. 43184 C.

Dies

Dies for Whiplash Regulator Springs. A. M. Cahill. Illustrates and describes details of a subpress die for making a difficult watch part. 2000 w. Am Mach—Nov. 28, 1912. No. 37835.

Making a Difficult Blanking Die. R. B. Hainsworth. Illustrates and describes details of an armature disk blanking die. 1200 w. Am Mach—Nov. 21, 1912. No. 37663.

Making Thread Cutting Dies. A number of short papers by different authors presented to Ry. Tool Foremen's Assn. 3000 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44266 C.

Drafting

Management of a Drawing Room. Folbert A. Schmidt. On the importance of suitable environment and fair dealing. 3000 w. Am Engr—Dec., 1912. No. 38263 C.

Drawings

Shading in Mechanical Drawing. Theodore W. Johnson. Presents a new rule for shading. Ills. 1400 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41295 D.

Shading in Mechanical Drawing. Theodore W. Johnson's paper is discussed. 2500 w. Jour Am Soc of Mech Engrs—Aug., 1913. No. 44515 D.

Fillets

The Effects of Fillets on the Strength of Cast Iron Machine Parts. Harry J. Klotz and Paul K. Miles. Reports investigations and results. 1500 w. Technograph—Feb., 1913. No. 41711 C.

Gages

Designs of and Materials for Gages. Lucian L. Haas. Gives a résumé of gages in use in manufacturing establishments, with information relating to the selection of materials, and tables giving dimensions for the various types. Ills. 2000 w. Am Mach—Jan. 23, 1913. No. 39284.

Miscellaneous Manufacturing Gages. L. L. Haas. Examples of a large variety of gages, used for gaging work in course of manufacture and when completed, are illustrated and described. 2500 w. Am Mach—March 13, 1913. No. 40420.

Gear Ratios

Transmission Gear Reduction Ratios. Otto M. Burkhardt. A mathematical discussion of the relative advantages of gear ratios forming a geometric series and an arithmetic series, respectively. 3500 w. Horseless Age—Feb. 12, 1913. No. 39856.

Gears

Making Hindley Worm-Gearing at the Brooklyn Navy Yard. Illustrated description. 1500 w. Mach, N Y—Nov., 1912. No. 37169 C.

Metals and Methods for Worm and Wheel. W. Kerr Thomas. Suggestions and recommendations. 1000 w. Am Mach—Nov. 21, 1912. No. 37667.

Designing a Hob for Hobbing Spur Gears. John Edgar. Explains method of determining the thread shape, number of flutes, and general dimensions. Ills. 1500 w. Mach, N Y—Nov., 1912. No. 37168 C.

Pressure Angle and Form of Thread. Hugh Kerr Thomas. A graphical analysis of worm gear problems. 2000 w. Am Mach—Dec. 5, 1912. No. 38056.

The Rating and Pricing of Speed-Reducing Gear—E. A. Vessey. Gives a chart for ascertaining ratio of speed-reducing gears at given horse-powers, explaining its use. 1500 w. Ir & Coal Trds Rev—Dec. 6, 1912. No. 38252 A.

Making Patterns for Machine-Molded Gears. Joseph Horner. Discusses the successful employment of the gear-molding machine. Ills. 2000 w. Foundry—Dec., 1912. No. 37989.

Variable Speed Gear-Driven Counter-Shaft. Illustrated description of an example of nest-gear drive, by means of which ten changes can be obtained instantly, and these can be doubled, if necessary. 500 w. Engrg—Dec. 13, 1912. No. 38522 A.

Spiral Gear Design. James H. Carver. Gives formulae for calculating spiral gears with a shaft angle of 45 degrees. Ills. Supplement. 700 w. Mach, N Y—Dec., 1912. Serial. 1st part. No. 37981 C.

Worm Reducing Gears. H. H. Broughton. Explains some of the factors on which satisfactory performance depends. 3000 w. Prac Engr—Nov. 28, 1912. No. 38119 A.

The Cutting and Generation of Gear Teeth by Modern Gear-Cutting Machinery. Vincent Gartside. Read before the Manchester Assn. of Engrs. Considers the different teeth forms in most general use, and their geometrical construction. Ills. 2200 w. Mech Engr—Jan. 17, 1913. Serial. 1st part. No. 39469 A.

The Measurement of the Teeth of Gears. George W. Burley. Describes the measurement by means of the gear-tooth caliper, giving formulae and curves. 1000 w. Prac Engr—Jan. 16, 1913. No. 39387 A.

The Strength of Gear Teeth. Guido

Gears

MACHINE ELEMENTS AND DESIGN

Gears

H. Marx. A record of experiments made to secure data upon the allowable unit fiber stress for cast iron gear teeth when in operation. Ills. 8500 w. Jour Am Soc of Mech Engrs—Jan., 1913. No. 39353 D.

A Practical Form of Tooth for Skew Bevel Gears. George M. Bartlett. Describes a proposed skew bevel gear tooth which can be produced by the molding generating process. 1800 w. Mach, N Y—Jan., 1913. No. 38728 C.

Chart for the Design of Worm Gearing. F. A. Halsey. Data from German and American sources put in form of a chart. 1500 w. Am Mach—Jan. 23, 1913. No. 39282.

Planetary Gears (Les trains planétaires). P. Larnelle. A study of their theory and application in reducing and increasing speeds in machine tools, motor vehicles, etc. Diagrams. 7000 w. Rev de Mecan—Nov., 1912. No. 39068 E + F.

Charts for Elliptical and T-Shaped Gear Arms. John B. Peddle. Gives charts for determining correct sections of gear arms of elliptical T and double T or cross shape. 800 w. Am Mach—Feb. 13, 1913. No. 39840.

Angle for Minimum Centre Distances for Spiral and Worm Gears. T. I. Moncrieff. Gives a new solution of the problem of designing compact spiral gear sets, with a chart. 1400 w. Horseless Age—Feb. 5, 1913. No. 39733.

Automobile Bevel Drive Gears. Douglas T. Hamilton. Illustrated description of forging operations, machining, heat-treating, inspecting and assembling. 5000 w. Mach, N Y—Feb., 1913. No. 39601 C.

The Williams - Janney Variable - Speed Gear. Illustrated detailed description of a successful hydraulic gear of this type. 2500 w. Engng—Jan. 31, 1913. No. 39802 A.

Modern High-Speed Gearing. H. Hubert Thorne. Abstract of paper read before the Rugby Engng. Soc. Discusses the general question of double helical gears, and their application to collieries and rolling mills. Ills. 2500 w. Ir & Coal Trds Rev—March 7, 1913. No. 40634 A.

Turning and Forming Cluster Gears. Henry M. Wood. Brief illustrated description of lathe work in some Cincinnati shops. 700 w. Mach, N Y—March, 1913. No. 40269 C.

Designing and Machining Elliptical Gears. Dent de Fer. Gives experiences in the construction of single-lobe or eccentric gears. Drawings. 1100 w. Mech Wld—March 21, 1913. No. 41010 A.

A Comparison of the Numerical and

Graphical Methods in the Design of Involute Spur Gears. A. Schein. Explains the use of charts in lessening the labor involved in gearing calculations, illustrating by examples. 2500 w. Gen Elec Rev—April, 1913. No. 40994 C.

Modern High-Speed Gearing. H. Hubert Thorne. From a paper read before the Rugby Engng Soc. Considers the advantages of double helical gears and the merits and demerits of the two types. Ills. 2700 w. Mech Wld—April 4, 1913. No. 41231 A.

Spur-Gearing. J. B. M. Knutsen. From a paper read before the Victorian Inst. of Elec. Engrs. Considers the design of the tooth, materials used, etc. 2000 w. Mech. Wld—April 18, 1913. Serial. 1st part. No. 41762 A.

Geometric Studies on Helicoidal Gears (Étude géométrique des engrenages hélicoïdaux). P. Massot. A detailed mathematical study. Ills. 53 pp. Rev de Mecan—March 31, 1913. No. 42167 E + F.

A New Hydraulic Transmission Gear. Illustrates and describes a compact, simple device applicable to a wide variety of uses. 1800 w. Ir Age—May 29, 1913. No. 42555 C.

Duplication of Gears Having Long and Short Addenda. E. Winslow Baxter. Compiled with special reference to the conditions in automobile repair shops. 1500 w. Mach, N Y—June, 1913. No. 42571 C.

Eccentric or Differential Gears. H. B. Heign. Explains the principle of the two-gear and the four-gear types, giving formulæ for velocity ratio. Ills. 1500 w. Mach, N Y—June, 1913. No. 42575 C.

Power Transmitted by Herring-Bone Gears. J. E. Holveck. Gives tables showing the horsepower transmitted by this type of gearing for various pitches in cast iron and cast steel with pitch line velocities ranging from 400 to 2000 feet per minute. 1000 w. Mach, N Y—June, 1913. No. 42574 C.

The Heat Treatment of Gears at the Boston Gear Works. George L. Colburn. Describes apparatus and treatment developed with special reference to gear requirements. Ills. 1500 w. Mach, N Y—June, 1913. No. 42567 C.

Efficiency of Toothed Gearing. W. M. Wallace. Discusses closeness of fit, need for experiment, shape of tooth, etc., in the present number. Ills. 1100 w. Prac Engr—July 24, 1913. Serial, 1st part. No. 43984 A.

The Gears of Modern Cranes. Joseph Horner. Discusses the requirements and how they are best fulfilled in the different systems in use. 1000 w. Mech Wld

Consult Classification of the Index. See page 9.

Gyroscope

—July 11, 1913. Serial, 1st part. No. 43898 A.

Tramcar Gear-Wheels and Pinions. Brief discussion of the tool steel process, under which wheels and pinions are treated to ensure long life as compared with ordinary materials. 1200 w. Elec Rev, Lond—July 18, 1913. No. 43950 A.

Hole and Pin Gearing. Laurence Hutchinson. Discusses this form of gearing and the uses for which it is specially adapted. 1000 w. Prac Engr—Aug. 14, 1913. No. 44506 A.

Standard Involute Gearing. Majority report of the committee on standards for involute gears. Discussion. 5000 w. Jour Am Soc of Mech Engrs—Sept., 1913. No. 45418 D.

A Practical Chart for Determining the Horsepower of Spur Gears. Frederic W. James. Gives a chart for the solution of gear problems, with explanation of its use. 1200 w. Eng News—Oct. 9, 1913. No. 45800.

Tools for Machining Bevel Driving Gears. Albert A. Dowd. Describes in detail the process of forming the blanks for automobile driving gears on a vertical turret lathe and boring of the holes. Ills. 2000 w. Horseless Age—Oct. 22, 1913. No. 46192.

See also Molding and Planers, under *Machine Works and Foundries*.

Gyroscope

Engineering Applications of the Gyroscope. Elmer A. Sperry. Considers its application to the stabilizing of ships, especially warships; its value in heavier-than-air machines, and various other engineering applications. Ills. 7000 w. Jour Fr Inst—May, 1913. No. 42266 D.

Gyrostats

Gyrostats and Gyrostatic Action. Prof. Andrew Gray's address at the Royal Institution. An experimental study of models. Ills. 5000 w. Nature—April 10, 1913. Serial, 1st part. No. 41371 A.

Hooks

The Strength of Hooks and Similar Curved Beams. A mathematical investigation. 2500 w. Engng—Sept. 5, 1913. No. 45152 A.

Interchangeability

Some Indirect Causes of Imperfect Interchangeability. A. Whitehead. Explains some of the difficulties. 1500 w. Engng—March 7, 1913. No. 40707 A.

Keys

Keys and Keyways for Automobiles. First of two articles showing by illustrations and explaining in a practical manner about the keys used in automobile construction. 1500 w. Automobile—Sept. 4, 1913. Serial, 1st part. No. 44961.

MACHINE ELEMENTS AND DESIGN

Patterns

Saddle Keys. P. J. Haler, and H. T. Wright. Gives results of experimental investigations on a number of keys, describing the apparatus used and the precautions taken. Ills. 1500 w. Mech Wild Oct. 3, 1913. No. 45852 A.

Keyways

Dimensions of Taper Keys and Keyways. G. G. Dana. Explains a method, originated by the writer. Supplement. 1200 w. Mach, N Y—Feb., 1913. No. 39605 C.

Machine Design

The Design of Electrical Machines for Quiet Operation. G. Pontecorvo. Trans. from *Elec. Zeit.* Discusses magnetic noises, current noise, windage noise and methods of overcoming them, describing some of the difficulties in designing a. c. and d. c. motors, and generators for quiet operation. 2000 w. Elec Jour—Sept., 1913. No. 45102.

Mechanics

Approximate Solutions to Static Indeterminate Problems (Näherungslösungen statisch unbestimmter Probleme). H. Lorenz. Amplifications of the approximate functions of coordinates proposed by W. Ritz. 2200 w. Zeit des Ver deutscher Ing—April 5, 1913. No. 41470 D.

A Geometric Method for the Ready Solution of the More Important Equations in Mechanics (Méthode géométrique permettant d'établir simplement plusieurs équations importantes de mécanique). G. Clauzel. The solution of vectors. Diagrams. 10000 w. Rev de Mecan—Feb. 28, 1913. No. 41514 E + F.

The Principle of Relativity in Mechanics (Het relativiteitsbeginsel in de mechanica). G. J. Van de Well. A review of the principles of theoretical mechanics from the works of early and modern writers. Serial, 1st part. 2000 w. De Ingenieur—Sept. 20, 1913. No. 46098 D.

Models

Model-Room Tools and Methods. Frank B. Lucas. Illustrates and describes devices and methods used. 1200 w. Mach, N Y—Jan., 1913. No. 38726 C.

Pantagraph

A Pantagraph Which Draws on Steel with a Point of Flame. Henry Harrison Suplee. Describes the application of the pantagraph to the manipulation of the oxy-acetylene jet. Ills. 1000 w. Sci Am—Oct. 18, 1913. No. 45918.

Patterns

Designing Patterns to Save in Machine Work. Stuart Dean. Discusses things to be considered in pattern-making to minimize investment in patterns and an unwise amount of machine shop work. 3500 w. Ir Age—Nov. 14, 1912. No. 37754 C.

Consult Classification of the Index. See page 9.

Patterns

MACHINE ELEMENTS AND DESIGN

Valve Gear

Skeleton Patterns on Large Work. N. Johnson. Illustrated description of the economical casting of large turbine casings. 1000 w. *Am Mach*—Nov. 7, 1912. No. 37299.

On Patternmaking. James Glass. Suggestion for the construction of patterns and improvement of the work. 1000 w. *Am Found Assn*—Dec., 1912. No. 38607 N.

Making a Pattern for a Parsons Steam Turbine. C. A. Tupper. Illustrated discussion of details of the work. 2000 w. *Foundry*—Dec., 1912. No. 37987.

Practical Suggestions for Pattern Making (*Praktische Erfahrungen aus dem Betriebe der Modelltischlerei*). Otto Lippmann. Suggestions for the best methods in laying out and making wooden patterns. Ills. 2800 w. *Gieß-Zeit*—Dec. 1, 1912. No. 38426 D.

Patternmaking. T. R. Schofield. From a paper before the British Found. Assn. Discusses in detail the work of the patternmaker. 1800 w. *Mech Wld*—Jan. 10, 1913. Serial. 1st part. No. 39354 A.

Changing Conditions in the Pattern Shop. Calls attention to changes due to specialization and to improved machinery. 1600 w. *Mech Wld*—Jan. 3, 1913. No. 39150 A.

American Practice in Pattern Making (*La pratique américaine du noyautage*). H. Marquette Lane. A study of the high development of pattern making in America. 4300 w. *Rev de Metall*—Aug., 1913. No. 45323 H.

How to Select and Care for Pattern Lumber. E. F. Lake. Discusses the adaptability of the various woods for model-making, calling attention to the value of northern white pine. 3000 w. *Foundry*—Oct., 1913. No. 45708 C.

Loose Pieces in Patterns and Core-boxes. Describes methods of attaching loose pattern pieces. Ills. 1500 w. *Mech Wld*—Sept. 19, 1913. Serial, 1st part. No. 45563 A.

Pattern Shops

The Pattern Shop; With Relation to the Steel Foundry. E. R. Swanson. Considers pattern shop equipment and methods required in making large intricate castings for passenger and locomotive equipment. Ills. 1600 w. *Am Found Assn*—Oct., 1913. No. 46271 N.

Piston Rings

Rapid Production of Eccentric Piston Rings. Albert A. Dowd. Drawings and description of method used. Ring pots are bored on a multiple spindle and turned eccentrically in a lathe by means of a special expanded arbor. 1200 w. *Horseless Age*—Oct. 1, 1913. No. 45630.

See also same heading, under *Steam Engineering*.

Rotary Machines

High-Speed Rotary Machines (*Machines rotatives à très grandes vitesses*). Maurice Leblanc. A study of the mechanical action in turbines, compressors and dynamos. Ills. 115 pp. *Mem Soc Ing Civ de France*—Feb., 1913. No. 42170 G.

Shafts

On Determining Shaft Diameters. W. G. Dunkley. Gives charts for simplifying the calculations of shafting for combined torsion and bending stresses. 800 w. *Mach, N Y*—Aug., 1913. No. 44081 C.

Springs

A Useful Spring Table. George F. Summers. Table and explanation of its use. 800 w. *Am Mach*—Nov. 7, 1912. No. 37800.

Reducing Spring Manufacture to a Science. Illustrated description of a physical testing laboratory in Cleveland, O., to facilitate the scientific manufacture of motor vehicle springs. 2000 w. *Ir Trd Rev*—March 6, 1913. No. 40337.

Methods employed in Leaf Spring Manufacture. E. F. Lake. Describes improvements in processes and accuracy in mechanical working and heat treatment. Ills. 3500 w. *Ir Age*—March 20, 1913. No. 40714 C.

The Forming and Heat Treatment of Leaf Springs. E. F. Lake. Illustrates and describes improved modern methods. 2500 w. *Horseless Age*—March 12, 1913. No. 40676.

Spring Design. J. St. Vincent Pletts. Develops formulae. 600 w. *Engr, Lond*—July 18, 1913. No. 43973 A.

Slide-Rule for Spring Calculations. Josef G. Dahlstrand. Gives rapid methods of calculation based on Begtrup's formulae. 1000 w. *Mach, N Y*—July, 1913. No. 43362 C.

Helical Spring Calculations. Lawford H. Fry. Diagram, with explanation of the method of using. 2000 w. *Engng*—Aug. 1, 1913. Serial, 1st part. No. 44319 A.

Heat Treatment of Leaf Springs. E. F. Lake. Discussion of the treatment needed and faults of present methods. 2500 w. *S A E Bul*—Aug., 1913. No. 45091 N.

See also same heading, under *Automobiles*.

Valve Gears

A Critical Valve Gear Analysis. George A. Hartman. A comparison of the three types of valve gears most in use, with conclusions. Ills. 2000 w. *Ry & Engng Rev*—Jan. 11, 1913. No. 39114.

The Florian Angéle Valve Gear. Brief

Consult Classification of the Index. See page 9.

Valves

MACHINE WORKS AND FOUNDRIES

Annealing

review of types of valve gear used, and produces drawings made by Florian Angéle and presented March 8, 1893, showing he was first to patent a link motion. It shows a remarkable anticipation of the present day mechanism. 800 w. Engr, Lond—Dec. 27, 1912. No. 38904 A.

See also Engine Valves, under *Steam Engineering*, and Locomotive Valves, under *RAILWAY ENGINEERING, Motive Power and Equipment*.

Valves

Causes of Failure of Manganese-Bronze Castings for Valves. The presence of dross in the castings is discussed and difficulties from the necessary use of aluminum. 1500 w. Brass Wld—Sept., 1913. No. 45206.

Velocity

High Speed in Mechanics (Des grandes vitesses en mécanique). Maurice Leblanc, A study of the forces exerted under high velocities. Diagrams. 15000 w. Bul Soc d'Encour—March, 1913. No. 41519 E + F.

Worm Gears

Investigation of efficiency of Worm Gearing for Automobile Transmission. Discussion of William H. Kenerson's paper. 1800 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41307 D.

Problems of Worm Gear Design. Otto M. Burkhardt. An analytical investigation of contact conditions in a worm gear outside the plane of symmetry with different pressure angles. 2500 w. Horseless Age—July 9, 1913. Serial, 1st part. No. 43671.

MACHINE WORKS AND FOUNDRIES

Accident Prevention

Suggestions for Preventing Foundry Accidents. W. H. Cameron. An account of the experience of one of the smaller corporations in its efforts to prevent accidents. Ills. 4800 w. Am Found Assn—Dec., 1912. No. 38619 N.

The Prevention of Industrial Accidents. Abstract of an address by Melville W. Mix at the Conservation Congress at Indianapolis. Ills. 2000 w. Ind Engng—Dec., 1912. No. 38105 C.

The Prevention of Accidents in Steel Foundries. Guy W. Nelson. How the workmen are safeguarded against injuries. Ills. 2500 w. Foundry—Dec., 1912. No. 37992.

Three Years of Accident Prevention. Illustrated report of results of the Eastman Kodak Co., Rochester, N. Y. 1200 w. Ir Age—May 1, 1913. No. 41799 C.

Accident Prevention. James B. Douglas. Revision of an illustrated talk at the Public Policy meeting, Chicago, June 4, 1913. 2500 w. Sci Am Sup—Oct. 11, 1913. No. 45760.

Prevention of Accidents in the Foundry. Alexander E. Outerbridge, Jr. Illustrates and describes methods employed by William Sellers & Co., Inc., with excellent results. 2000 w. Ir Age—Oct. 9, 1913. No. 45763 C.

Prevention of Accidents in Factories. Good Work Done by a German Firm. From the *A E G Jour*. Illustrates and describes devices for the protection of workmen against accidents. 1000 w. Sci Am Sup—Oct. 4, 1913. No. 45616.

Recording Memoranda on Accident Prevention. Thomas D. West. Suggestions helpful in promoting safety. 1200 w. Am

Found Assn—Oct., 1913. No. 46260 N.

Safety First in the Boiler Shop. C. E. Lester. Calls attention to details needing inspection and care. 2500 w. Boiler Worker—Oct., 1913. No. 45769.

Accidents

See same heading, under *RAILWAY ENGINEERING, Permanent Way and Buildings*.

Annealing

The Annealing of Steel Castings. Edwin F. Cone. Report of extensive investigations showing its effects on the structure. A plea for the slow-cooling process. Photomicrographs. 4000 w. Ir Age—May 1, 1913. No. 41798 C.

The Effect of Annealing on the Structure of Alloys (Contribution à l'étude de l'influence du recuit sur la structure des alliages). M. A. Portevin. A detailed micrographic study on the physico-chemical effects to be noted. Ills. 20,000 w. Rev de Metal—June, 1913. No. 43062 H.

Studies on the Development of Grain in Metals by Annealing After Cold Working (Recherches sur le développement des grains des métaux par recuit apres écrouissage). Felix Robin. An examination of the crystalline structure. Ills. 17,500 w. Rev de Metal—June, 1913. No. 43063 H.

The Development of Grain in Alloys by Annealing (Développement des grains de recuit dans les alliages). Felix Robin. Studies on alloys of tin, lead, zinc, aluminum, and copper. Ills. 4000 w. Rev de Metal—June, 1913. No. 43064 H.

The Annealing of Steel in an Alternating Magnetic Field. H. Pender and R. L. Jones. Abstract of an article in the *Phys. Rev*. Gives results of experiments

Arbors

on the effect on the magnetic qualities of exposing steel to a varying magnetic field during annealing. 3000 w. *Elect'n*, Lond—Aug. 22, 1913. No. 44906 A.

A Study of the Annealing Process for Malleable Castings. E. L. Leasman. Reports on experimental study with conclusions. Ills. 7500 w. *Am Found Assn*—Oct., 1913. No. 46264 N.

See also Hardening, under **MINING AND METALLURGY, Iron and Steel.**

Arbors

Arbors for Second-Operation Work. Albert A. Dowd. Drawings and descriptions of various types used for turning, boring and grinding, illustrating applications. 4000 w. *Mach*, N Y—Oct., 1913. No. 45608 C.

Work Holding Arbors and Methods for Turning Operations. Illustrates and describes devices designed for holding work in the Fay automatic lathe. 3500 w. *Mach*, N Y—Oct., 1913. No. 45601 C.

Axles

Forging Steel Axles by a Steam-Hydraulic Press. Illustrated description of the Carbon Steel Co.'s axle manufacturing process. 900 w. *Ir Trd Rev*—Dec. 26, 1912. No. 38536.

Backlash

The Elimination of Backlash. W. A. Field. Illustrates and describes devices for various applications. 1200 w. *Mech Wld*—April 18, 1913. No. 41760 A.

Brass Founding

A New Electric Furnace for Melting Brass. G. H. Clamer and Carl Hering. Read before the Am. Inst. of Metals. Discusses the factors involved and economies effected, describing a melting medium that has given good results. 4000 w. *Foundry*—Nov., 1912. No. 37234.

The Manufacture of Composition and Yellow-Brass Ingot at the Works of Whipple & Choate. Illustrated detailed description of methods of production. 3000 w. *Brass Wld*—Dec., 1912. No. 38570.

The Judicious Use of Cheap Metals in the Brass Foundry. A. Napier. Discusses methods of calculating the cost of different mixtures and the saving to be effected by variations in composition. 1500 w. *Mech Wld*—Dec. 13, 1912. Serial. 1st part. No. 38517 A.

Producing Brass Ingots in a Specially-Equipped Detroit Plant. Illustrated detailed description of a new plant and its equipment. 2500 w. *Foundry*—Feb., 1913. No. 39652.

Some Aids to the Brass Foundry Management. W. M. Corse. Read before the Pittsburgh Found. Assn. Explains the system of a large shop for ascertaining

MACHINE WORKS AND FOUNDRIES**Bronze Founding**

metal losses, cost per pound, etc. 2500 w. *Foundry*—April, 1913. No. 41037.

The Production and Working of Sheet Brass. Clarence Hoyt Stilson. Discusses possible improvements of manufacturing importance. 3500 w. *Engineering Magazine*—May, 1913. No. 41633 B.

Brass Foundries

The New Brass Foundry of the English & Mersick Company of New Haven, Conn. Illustrated description of the brass foundry of a shop devoted almost entirely to the manufacture of automobile products. 1500 w. *Brass Wld*—Aug., 1913. No. 44508.

The Application of Producer Gas to Brass Foundries. E. F. Bulmahn. Discusses the subject of economical fuel with special reference to melting in the brass foundry industry. Ills. 5000 w. *Am Inst of Metals*—Oct., 1913. No. 46277 N.

The Brass Foundry of the Future. C. P. Karr. Reviews some of the changes taking place in the management of foundries. 2500 w. *Am Inst of Metals*—Oct., 1913. No. 46273 N.

The Bright Dipping of Brass. Describes the preliminary operations and some of the difficulties encountered. 1700 w. *Brass Wld*—Oct., 1913. No. 45999.

See Electrometallurgy, under **ELECTRICAL ENGINEERING, Electro-Chemistry.**

Brass Furnaces

Utilizing the Waste Heat from Brass Furnaces. Joseph Horner. Describes types designed to facilitate melting, with details of their construction. Ills. 1800 w. *Foundry*—March, 1913. No. 40287.

Briquetting Machine

Briquetting Machine for Metal Borings and Turnings. Illustrated description of a machine built in Leeds, Eng. 2500 w. *Engng*—Nov. 29, 1912. No. 38128 A.

Broaches

Points on Broach-Making. Franklin D. Jones. Drawings and discussion of features of broach-making. 1500 w. *Mach*, N Y—Oct., 1913. No. 45603 C.

Bronze Founding

The Pouring Temperature of Manganese Bronze. H. W. Gillett. Read before the Am. Inst. of Metals. Gives results of investigation. 1200 w. *Foundry*—Nov., 1912. No. 37236.

The Molding of Bronze Statuary. E. A. Suverkrop. Illustrated detailed description of the making of a mold for a bronze statuette by the false core method. 2500 w. *Am Mach*—Dec. 5, 1912. No. 38055.

Copper Mold Casting (Kupferformguss). Friedr. Hüser. A study of the results obtained with pure copper and

Cams

various alloy percentages. Ills. 2000 w. Giess Zeit—April 15, 1913. No. 42123 D.

Cams

Automobile Cam Controlling Device. Christian F. Meyer. Illustrates and describes details of the design of cam mechanism for a knitting machine and its operation. 2200 w. Am Mach—Feb. 27, 1913. No. 40143.

Case-Hardening

The Thermal Conductivity of Carburizing Materials. J. H. Nead and J. N. Bourg. Report of tests made to determine the relative rapidity with which different carburizing materials would heat. 1200 w. Eng News—Oct. 31, 1912. No. 37207.

Note on the Case-Hardening of Special Steels. Albert Dauveur and G. A. Reinhardt. Describes tests of case-hardening yielding martensitic cases without recourse to the quenching bath. Ills. 1500 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37895 F.

Notes on the Science of Case Hardening Iron by means of Gases (Beiträge zur Kenntnis der Zementation des Eisens mittels Gasen). Franz Kurek. A metallographic study of the influence of various gases on case hardening. Plate. 3500 w. Stahl u Eisen—Oct. 24, 1912. No. 37407 D.

Case Carbonizing. Marcus T. Lothrop. Reports experimental researches undertaken to determine the causes of irregularity and the precautions necessary to secure uniform results. Ills. 13500 w. Jour Am Soc of Mech Engrs—Dec., 1912. No. 38508 D.

Case Carbonizing. Marcus T. Lothrop's paper is discussed. Ills. 2500 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41306 D.

Heat Treating at an Automobile Engine Plant. Illustrates and describes an installation for tempering, heat treating and case hardening at works in Detroit. 1300 w. Ir Age—Jan. 2, 1913. No. 38759 C.

Hardening Machine—Tool Parts. F. R. Parsons. Describes method of casehardening used by the writer. 800 w. Mech Wld—April 11, 1913. No. 41385 A.

Case-Hardening. David Keachie. (Abstract.) Describes the process and methods of testing. 5000 w. Mech Engr—May 30, 1913. No. 42773 A.

See also Steel, under MINING AND METALLURGY, Iron and Steel.

Casting Ladles

Bunsen Burners for Heating Ladles by Gas (Bunsenbrenner für Gasbeheizung von Giesspfannen). Otto Johannsen. Brief description of several types of

MACHINE WORKS AND FOUNDRIES

Castings

burners. Ills. 1500 w. Stahl u Eisen—July 31, 1913. No. 44609 D.

Castings

Blowholes in Castings. Walter J. May. Brief discussion of their cause and how to deal with them. 700 w. Prac Engr—Oct. 24, 1912. No. 37176 A.

The Difficult Art of Casting German Silver. C. P. Karr. Read before the Am. Inst. of Metals. Compares American, English and German methods of making this alloy, and gives hints on molding and casting. 1500 w. Foundry—Nov., 1912. No. 37235.

A Large Gun-Metal Casting Recently Made at the Works of the Whitlock Coil Pipe Company, Hartford, Conn. Illustrated description of an interesting casting to be used on the Panama Canal. 700 w. Brass Wld—Nov., 1912. No. 37796.

Steel Cast Locomotive Frames. Edwin F. Cone. Discusses the importance of the heat treatment and considers high carbon, vanadium, and nickel castings. Ills. 1800 w. Ir Age—Oct. 31, 1912. No. 37743 C.

Standard Specifications for Steel Castings. Gives the specifications adopted by the American Society for Testing Materials, June 1, 1912. 1500 w. Am Found Assn—Dec., 1912. No. 38614 N.

Economical Cleaning of Castings by Sand Blast. B. H. Reddy. Considers the abrasive material, the air pressure, sand blast nozzles and machines, etc. Ills. 4000 w. Am Found Assn—Dec., 1912. No. 38611 N.

Camber, and the Straightening of Bent Castings. Discusses effects and methods of straightening. Ills. 1500 w. Mech Wld—Dec. 27, 1912. No. 38887 A.

Commercial Tendencies in Malleable Castings Practice. Richard Moldenke. Calls attention to a tendency in America which results in unreliable castings. 1200 w. Am Found Assn—Dec., 1912. No. 39526 N.

Specifications for Machinery Castings. John Jermain Porter. Thinks their use would result in improved quality, but higher cost. 3000 w. Ir Age—Jan. 2, 1913. No. 38761 C.

Hydraulic Ram Casting. William Fines. Directions for making sound hydraulic castings. Ills. 500 w. Prac Engr—Dec. 19, 1912. No. 38868 A.

Practice in the Casting of Cylinders for Hydraulic Presses (Erfahrungen beim Giessen gusseiserner). Zylinder für hydraulische Pressen). C. Brückner. Notes on points to be observed. Ills. 1800 w. Giess Zeit—Jan. 1, 1913. No. 40015 D.

Methods of Preparing Basic Open-

Consult Classification of the Index. See page 9.

Castings

MACHINE WORKS AND FOUNDRIES

Castings

Hearth Steel for Castings. H. F. Miller, Jr. Considers important factors in the production of solid castings. 2000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40894 F.

Steam-Metal Valve Castings; Their Leakage and Method of overcoming It. Discusses the causes of leakage in valve castings and the remedies. Ills. 2500 w. Brass Wld—March, 1913. No. 40693.

European Electric Steel Automobile Castings. E. F. Lake. Illustrates and describes characteristics of castings made in a Switzerland steel foundry. 1800 w. Ir Age—March 27, 1913. No. 40887 C.

Producing Castings for the Automobile Trade. Illustrates and describes how aluminum crank cases and gray iron pistons are molded and cast. 2000 w. Foundry—March, 1913. No. 40284.

Melting Process of the Steel Foundry. Edwin F. Cone. Considers different methods of producing steel castings, and their chemical, physical, and metallographic characteristics. Ills. 4000 w. Ir Age—April 3, 1913. No. 41069 C.

The Contraction of Castings. Walter J. May. Discusses some shrinkage troubles and their causes. 1000 w. Mech Wld—March 21, 1913. No. 41011 A.

Castings Made with Screw-Threads. Walter J. May. Describes the method of doing this work. 900 w. Mech Wld—April 4, 1913. No. 41232 A.

Steel Castings and the Substitutes for Them. Henry Souther. Explains differences in chemical composition, their physical qualities, and other products that are not steel. 1600 w. Ir Age—May 22, 1913. No. 42306 C.

Steel Castings from the Electric Furnace. Edwin F. Cone. Illustrated description of a modified Heroult installation at Easton, Pa., and the characteristics of castings of varying carbon content. 2500 w. Ir Age—May 29, 1913. No. 42554 C.

Application and Production of Die Castings for Automobiles. Walter Berterton. Considers the present stage of development of this method of production, and problems yet to be overcome. 3000 w. Mech Engr—May 30, 1913. Serial. 1st part. No. 42772 A.

Making Aluminum Automobile Castings at the Works of the United Foundry & Machine Company, at Bridgeport, Conn. Illustrated description of the plant, its equipment, and methods. 1800 w. Brass Wld—June, 1913. No. 42944.

The Manufacture of Manganese Steel Castings. Illustrates and describes the practice of a Chicago company. 2500 w. Ir Trd Rev—June 19, 1913. No. 42965.

Malleable Iron Castings. Enrique Tou-

ceda. Discusses in detail the steps of the malleable iron process, the physical properties of malleable iron, and specifications. Ills. 3500 w. S A E Bul—May, 1913. No. 42471 N.

Malleable Iron Castings for Automobile Work. Enrique Touceda. Read before Soc. of Auto Engrs. Discussion of the thickness of section that can be annealed, the limit of silicon content and the strength and adaptability of malleable. Ills. 3300 w. Foundry—July, 1913. No. 43413.

Secrets of Automobile Casting Manufacture. Illustrated description of how one foundry attained success in this difficult branch of gray iron work. 4500 w. Foundry—July, 1913. No. 43411.

The Heat-Treatment of Carbon Steel Castings. John H. Hall. Read before the Am. Soc. for Test. Mat. Tests which show that accelerated cooling is essential to obtain a fine microstructure in annealed steel castings. Ills. 2000 w. Ir Trd Rev—July 10, 1913. No. 43601.

The Production of Malleable Castings. Richard Moldenke. Address before the Am. Chem. Soc. Information concerning the structure, service, processes, etc. 4000 w. Am Found Assn—1913. No. 43334 N.

Steel Casting (Ueber Stahlformguss). Dr. Geilenkirchen. A study of the metallurgical phases presented in the casting of steel. Serial, 1st part. 2300 w. Giess Zeit—June 15, 1913. No. 43501 D.

Typical Specifications for Steel Castings. Edwin F. Cone. Shows the diversities in those governing the production of railroad, industrial and marine work. 2500 w. Ir Age—July 31, 1913. No. 44102 C.

Cast Iron and Steel Casting in Electro-Machine Construction (Gusseisen und Stahlformguss im Elektro-Maschinenbau). Fr. Goltze. Explaining the extra precautions to be taken and necessary studies to be made. Ills. Serial, 1st part. 2800 w. Giess Zeit—Aug. 1, 1913. No. 44627 D.

Iron Matte and Impure Castings (Mattes Eisen und unreiner Guss). F. Luhr. The causes of impurity and their elimination. Serial, 1st part. 3000 w. Giess Zeit—July 15, 1913. No. 44626 D.

On the Influence of Changing the Composition of Malleable Castings. P. Rodigin. Gives tests made on the effect of welding diverse elements to malleable cast iron in order to study the resulting chemical and physical properties. 800 w. Am Found Assn—Oct., 1913. No. 46265 N.

Electric Steel Castings. F. T. Snyder.

Castings

MACHINE WORKS AND FOUNDRIES

Core-Rooms

A brief statement of the present situation regarding the electric melting of steel for small castings. 1200 w. Am Found Assn—Oct., 1913. No. 46254 N.

The Story of Some Difficult Steel Castings. E. C. Jensen. Illustrates and describes the foundry, machining, testing and transportation problems of a shaft cover of New York's Catskill aqueduct. 5000 w. Ir Age—Oct. 9, 1913. No. 45761 C.

Some Difficulties in Pouring Steel Castings. R. A. Bull. Discusses leaking ladles and difficulties attending the transfer of steel from furnace to mold. 1800 w. Am Found Assn—Oct., 1913. No. 46262 N.

A Latter-Day Stove Shop. Edgar C. Kreutzberg. Illustrates and describes its equipment for fine casting production. 5000 w. Foundry—Oct., 1913. Special. No. 45707 C.

Castings Alloys in Permanent Moulds. Walter J. May. Suggestions for the work. 1200 w. Mech Wld—Oct. 3, 1913. No. 45851 A.

The Cast-Steel Dome for the Drainage Shaft of the Hudson River Siphon, Catskill Aqueduct. Illustrates and describes the methods of manufacture and testing of dome and fittings, the transportation and erection. 5000 w. Eng News—Oct. 9, 1913. No. 45797.

Gray Iron for Motor Car Castings. H. B. Swan. An illustrated account of experimental work in the hope of producing a better iron for motor car castings. 3500 w. Am Found Assn—Oct., 1913. No. 46253 N.

Making of Gray Iron Motor Car Castings. H. B. Swan. Read before the Am. Found. Assn. Considers the effect of steel scrap, and the influence of the structure of various pig irons on the properties of the castings. Ills. 3500 w. Ir Age—Oct. 23, 1913. No. 46124 C.

Memoranda on Automobile Cylinder Founding. Robert Crawford. Calls attention to points needing care. 900 w. Am Found Assn—Oct., 1913. No. 46267 N.

See also Annealing, Foundries and Molding, under *Machine Works and Foundries*; and Valves, under *Machine Elements and Design*; also Wheels, under *Railway Engineering, Motive Power and Equipment*.

Chain Making

The Manufacture of Chains. Jas. H. Baker. A summary of the methods in use for the manufacture of welded and unwelded chains, and a comparison of chain strengths. 4500 w. Am Mach—Nov. 19, 1912. No. 37380.

Chip Briquetting

The Recovery of Best Grade Castings by the Use of Metal Chips (Die Herstellung von Qualitätsguss unter Verwendung von Metallspänen). J. Mehrrens. An account of good results derived from the use of chip briquettes. Ills. 2500 w. Zeitschr des Vder deutscher Ing—Oct. 26, 1912. No. 37452 D.

The Use of Briquettes in Blast-Furnace Practice (Ueber die Verwendung von Kohlenstoffsteinen im Hochofenbetrieb). C. Geiger. Brief description of application, followed by lengthy discussion by Herr Schulte-Kump. Ills. 3800 w. Stahl u Eisen—Oct. 10, 1912. No. 37402 D.

Briquetting Plant for Metal Turnings and Borings. Illustrates and describes various plants erected by a Berlin firm. 2500 w. Engng—Jan. 24, 1913. No. 39799 A.

Chucks

Making the Horton-Morrow Chuck. Chester L. Lucas. Illustrates and describes the manufacturing methods employed. 3000 w. Mach, N. Y—June, 1913. No. 42576 C.

Cleaning Rooms

The Modern Cleaning Room for Castings (Die moderne Gussputzerei). Andreas Koob. A study of ideal arrangements and equipment. Ills. 2800 w. Giess Zeit—Sept. 15, 1913. No. 46023 D.

Coils

Special Machine for Winding Coils. Illustrated description of temporary rigs and of a semi-automatic machine for winding coils from the flat copper strip. 2500 w. Am Mach—Feb. 27, 1913. No. 40139.

Cold-Heading

Cold-Heading. Chester L. Lucas. Explains the principles of cold-heading, reviewing its history, and illustrates samples and types of machine, etc. 2500 w. Mach, N. Y—May, 1913. Serial. 1st part. No. 41785 C.

Copper-Clad Steel

Dip-Coppering Small Iron and Steel Goods. Gives a solution which has been found to give good results, and information relating to the process. 1500 w. Brass Wld—March, 1913. No. 40696.

Copper Founding

Oxidizing Agents in Copper Founding and Their Uses (Le role des oxydants dans la fonderie de cuivre et leur emploi). M. Portevin. Effects from the employment of the powder, "Homogen," in bronzes. Ills. 1500 w. Rev de Metall—Aug., 1913. No. 45320 H.

Core-Rooms

Features of American Core-room Practice. Henry Marquette Lane. The pres-

Cores

MACHINE WORKS AND FOUNDRIES

Cupola Practice

ent article considers the effect of machinery on the core-room, green and dry binders, binders in common use, and water soluble binders. 1500 w. *Mech Wld*—Oct. 10, 1913. Serial, 1st part. No. 45980 A.

Core Room Economics. O. F. Flumerfelt. Study and analysis of the different phases in the production of cores. 3000 w. *Am Inst of Metals*—Oct., 1913. No. 46274 N.

Cores

Jobs Where Coring Helps the Moulder. Joseph Horner. Discusses methods of coring, illustrating by examples. 800 w. *Mech Wld*—March 28, 1913. Serial. 1st part. No. 41139 A.

Core Testing and Standards. Henry Marquette Lane. A brief report of progress, giving results of tests. Ills. 1500 w. *Am Found Assn*—Oct., 1913. No. 46259 N.

Cost Estimating

Cost Estimating on Screw Machine Products. Gives details of the system of fixing prices and how the work is routed through the plant. Ills. 2500 w. *Ir Trd Rec*—April 17, 1913. No. 41321.

Crucibles

The Making of Magnesia Crucibles. Oliver P. Watts. Gives results of experiments in making these crucibles. 1000 w. *Wis Engr*—Nov., 1912. No. 38563 C.

Care of Crucibles. Walter J. May. Criticism of treatment given them, with suggestions. 900 w. *Prac Engr*—March, 1913. No. 40472 A.

Cupola Furnaces

Notes on Foundry Practice and Especially on Cupola Furnace Plants (Mitteilungen aus dem Giessereibetrieb unter besonderer Berücksichtigung der Kupolofenanlage. J. Mehrtens. Practical notes on operation in various German plants. Serial. 1st part. 1400 w. *Giess Zeit*—April 1, 1913. No. 41425 D.

Experimental Investigation of the Cupola Melting Process. Frederick Hueser. Reviewed from *Stahl und Eisen*. Investigation of the metallurgical and thermic conditions incident to the cupola melting process. Ills. 1500 w. *Am Found Assn*—May, 1913. No. 42495 N.

Foundry-Cupola Gases and Temperatures. A. W. Belden. An investigation of the processes that take place in a foundry cupola during a melt. Ills. 6500 w. *U S Bureau of Mines*—Bul 54. No. 43217 N.

The Choice of a Cupola. Walter J. May. Suggestions for the selection and arrangement. 1000 w. *Mech Wld*—June 13, 1913. No. 43141 A.

Construction and operation of Cupola

Furnaces (Bau und Betrieb von kupolöfen). H. Kloss. Suggestions for the most advantageous construction, materials to be used, etc. 4900 w. *Feuerungs*—May 15, 1913. No. 43032 D.

Blast-Quantity and Pressure in Cupola Working. F. J. Cook. Read before the British Found. Assn. Gives the author's opinions and experiences, with results of tests, and conclusion. 3000 w. *Ir & Coal Trd Rec*—July 4, 1913. No. 43726 A.

A Remarkable Cupola Furnace Explosion (Ueber eine bemerkenswerte Kupolofen Explosion). Richard Fichtner. An account of an explosion in a Bohemian foundry, with a study of probable causes. Ills. 3800 w. *Stahl u Eisen*—June 26, 1913. No. 43508 D.

A Remarkable Cupola Explosion. R. Fichtner. Trans. from *Stahl und Eisen*. Describes an explosion probably due to the rapid formation of carbon monoxide. Ills. 1300 w. *Ir Age*—Aug. 14, 1913. No. 44342 C.

Cupola Furnace Construction with Tilt- ing Forehearth (Kupolofenanlage mit kippbaren Vorherden). Edmund Neufang. Illustrated description of the operation and design of new type of construction. 2200 w. *Stahl u Eisen*—June 26, 1913. No. 43509 D.

An Investigation of Cupola Melting Operations. A. W. Beldon. Results of government tests to ascertain the location of the melting zone, reactions of gases and best methods of charging. Ills. 5500 w. *Foundry*—Aug., 1913. No. 44093.

Blast Quantity and Pressure in Cupola Working. F. J. Cook. Read before the British Found Assn. Investigates the maximum outputs with varying blasts, effect of blast on quality, giving a summary of conclusions from tests. 2000 w. *Ir Age*—Aug. 7, 1913. No. 44202 C.

Cupola Studies. H. B. Pulsifer. A report of student work at the Armour Inst. of Technology, with discussion of results. 2500 w. *Chem Engr*—Sept., 1913. No. 45593 C.

The Use of Air-Dried Refractory Stone in Cupola Furnace Practice (Ueber die Verwendung lufttrockner feuerfester Steine im Kupolofenbetrieb). O. Hoese. A study and comparison of the refractory properties of various minerals and their adaptation. Serial, 1st part. 1800 w. *Giess Zeit*—Aug. 15, 1913. No. 46018 D.

Cupola Practice

Air Required for Combustion in the Cupola, and a Simple Blast Velocity Gauge. P. Munnoch. Explains cupola combustion and describes a Pitot tube

Consult Classification of the Index. See page 9.

Cupolas

and gauge used to measure the velocity of air. Ills. 2000 w. Am Found Assn—Dec., 1912. No. 38601 N.

Lighting Fires in Cupolas. A. H. Stein. Illustrates and describes the lighting up of the coke bed of the cupola by the use of oil burners. 1000 w. Am Found Assn—Dec., 1912. No. 38608 N.

Rational Cupola Melting Practice. Dr. Richard Moldenke. A study of cupola melting and the principles governing the cupola furnace. 3500 w. Am Found Assn—Dec., 1912. No. 38620 N.

Cupolas

Melting Iron in the Cupola-Furnace. R. Moldenke. Discusses the conditions which should be observed and gives suggestions for producing success in the cupola-melting process. 3500 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39444 F.

Cutting Machine

The Taylor Rotary Cutting-Off Machine. Illustrated description of a machine exhibited at Olympia. 700 w. Engng—Jan. 10, 1913. No. 39260 A.

Dies

Some Interesting Drawing and Curling Dies. Douglas T. Hamilton. Illustrated description of examples from a Columbus, O., shop. 1500 w. Mach, N Y—Jan., 1913. No. 38729 C.

Van Wagner Mfg. Co.'s Die-Casting Practice. Chester L. Lucas. Illustrates and describes the casting machines and dies used in producing pressure castings. 3000 w. Mach, N Y—Jan., 1913. No. 38717 C.

Making Dies Used in the Die-Casting Process. Describes the permanent molds used for the production of white metal parts, how they are designed and manufactured. Ills. 2500 w. Foundry—May, 1913. No. 41854.

Hardening Hammer dies. William E. Snow. Discusses heating and packing, quenching and quenching baths, tempering, etc. Ills. 2500 w. Mach, N Y—June, 1913. No. 42568 C.

Making Dies Used in the Die-Casting Process. Illustrates and describes how the permanent molds used in the production of white metal parts are designed and manufactured. 2500 w. Ir Trd Rev—July 17, 1913. No. 43775.

Sectional Punch and Die Construction. A. L. Monrad. Plan and sectional views with description. 1500 w. Mach, N Y—July, 1913. No. 43367 C.

See also Cold-Heading, under *Machine Works and Foundries*.

Drilling

Locating Hole Centers in Tool Work. Francis Reuter. Explains a method of applying disks for spotting centers and

MACHINE WORKS AND FOUNDRIES**Exhaust Systems**

for truing up with the test indicator before boring. 900 w. Am Mach—Nov. 7, 1912. No. 37298.

Drilling Machines

Recent Drilling Machines at the Last International Exposition (Neuzeitliche Bohrmaschinen unter Berücksichtigung der letzten Weltausstellungen). Types of machines exhibited at recent shows. Ills. Serial. 1st part. 4000 w. Zeit f Werkzeug—Feb. 5, 1913. No. 40573 D.

Six-Spindle Drilling-Machine. Illustrations, with brief description of a machine designed and constructed for dealing with the steam-drums and water-pockets of water-tube boilers. 400 w. Engng—March 21, 1913. No. 41015 A.

Attachments for Sensitive Drilling Machine Tables. Fred Horner. Drawings and descriptions of special fittings. 700 w. Mech Wld—Oct. 10, 1913. Serial, 1st part. No. 45979 A.

Drills

The Vauclain Drill. Discussion of paper by A. C. Vauclain and H. T. Wille. 2500 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41302 D.

Quantity Production with Modern Gang Drills. Illustrates and describes how these machines are employed for drilling, reaming, facing, tapping and other operations. 2500 w. Ir Trd Rev—May 15, 1913. No. 42064.

Drop-Forgings

Drop-Forgings. Frank W. Trabold. An outline of the methods used and the history of the process. Discussion. 9500 w. S A E Bul—Nov., 1912. No. 38567 N.

Dust Extraction

See Exhaust Systems, under *Machine Works and Foundries*.

Enameling

Enameling Process for Cast Iron Sanitary Ware. Nelson E. Frissell. Report of an investigation of American enameling practice, including mixtures, cost of equipment, operation, etc. 4000 w. Foundry—June, 1913. No. 42597.

The Art of Enameling or the Coating of Steel and Iron with Glass. Raymond F. Nailier. Brief review of the history of the art, outlining present day methods and the recent development of enameling larger apparatus. 4000 w. Jour Am Soc of Mech Engrs—Oct., 1913. No. 46140 D.

A New Process for Enameling Silver and Other Metals. Describes a process patented by Walter L. Shepard. 1000 w. Brass Wld—Oct., 1913. No. 45998.

Exhaust Systems.

Exhaust Systems for Grinding, Polishing, and Buffing Wheels. The specifications prescribed by the New York State

Factory Equipment

MACHINE WORKS AND FOUNDRIES

Foundries

Department of Labor. 2000 w. Mach, N Y—May, 1913. No. 41792 C.

Factory Equipment

Factory Building Equipment Details. Harry C. Spillman. Illustrates and describes partitions, storage racks, work benches and other details of a Detroit plant. 1500 w. Ir Age—March 6, 1913. No. 40334 C.

Files

The Mechanical Testing of Files. George W. Burley. Discusses the demand for standard mechanical tests and test methods. 3500 w. Mach, N Y—Dec., 1912. No. 37984 C.

Finishing

Methods of Finishing Metal Surfaces. Edward K. Hammond. Explains the purpose of various finishes and how they are applied. Ills. 3500 w. Mach, N. Y.—July, 1913. No. 43361 C.

Fire Protection

Fire Protection at Lodge & Shipley Plant. Henry M. Wood. Illustrates and describes how the works are divided into districts equipped with fire-fighting apparatus for the use of brigades of employees. 1800 w. Ir Age—May 8, 1913. No. 41904 C.

See also same heading, under *Civil Engineering, Construction*.

Forging

Machine Forging. Douglas T. Hamilton. Illustrates and describes machines and methods employed in the manufacture of bolts, rivets, nuts, machine parts, etc. 2500 w. Mach, N Y—April, 1913. No. 40979 C.

Drop-forging. Describes recent changes introduced in the process of making steel drop-forgings. 700 w. Mech Wld—Sept. 5, 1913. Serial, 1st part. No. 45150 A.

The Influence of Forging Upon the Properties of Soft Mild Steel (Ueber den Einfluss des Schmiedens auf die Eigenschaften eines weichen Flusseisens). P. Oberhoffer. Results of a series of experiments upon metal rods, and the tests adopted. Curves. Serial, 1st part. 3500 w. Stahl u Eisen—Sept. 11, 1913. No. 45383 D.

Foundries

Steelwork Designs and Handling Equipment of a Large Foundry. Illustrates and describes heavy framework, crane system, and industrial track layout in a foundry producing 100 tons per day. 2000 w. Eng Rec—Nov. 9, 1912. No. 37353.

A Foundry Specializing in Machinery Castings. Illustrated description of the gray iron shop operated by the Fulton Iron Works, St. Louis. 2000 w. Foun-

dry—Nov., 1912. No. 37238.

Layout of Modern Gray Iron Foundries (Ueber Bodenbedarf moderner Graugießereien). Eugen Munk. A comparison of plans in use at various German works. 5600 w. Stahl u Eisen—Dec. 26, 1912. No. 39024 D.

The Relation of Foundry Floor Space to Output. Considers the area per ton of output of gray iron jobbing, implement, steel, and iron foundries. Ills. 2500 w. Foundry—May, 1913. No. 41855.

A Model Plant for Making Implement Castings. Illustrated description of a large gray iron foundry at Rockford, Ill. 2500 w. Foundry—May, 1913. No. 41851.

The Adolf-Emil Foundries in Esch (Die Adolf-Emil-Hütte in Esch). An illustrated description of this large German plant, covering the layout of yards, foundry equipment, laboratory, workmen's houses, etc. Plates. 11900 w. Stahl u Eisen—May 1, 1913. No. 42114 D.

Improvements at the Plant of the Falk Company. Illustrates and describes the gas producer installation, coal handling plant, and new open-hearth and annealing furnaces. 2000 w. Ir Trd Rev—June 26, 1913. No. 43236.

The Foundry Floor and Its Maintenance. Walter J. May. Suggestions for keeping the floor in good condition. 1200 w. Mech Wld—June 27, 1913. No. 43639 A.

A Six-Story Continuous Foundry Building. Oliver J. Abell. Illustrated description of the new structure of the Ford Motor Co., Detroit, and other plant extensions. 4500 w. Ir Age—July 3, 1913. No. 43449 C.

How a Modern Railroad Foundry Is Equipped. Edgar Kreutzberg. Illustrated description of the new shop of the D. & H. Co. for the production of gray iron and steel castings. 2000 w. Foundry—Sept., 1913. No. 44857.

The Labor and Installation of Foundries; Also Some Plants in General in America (Le travail et l'installation des fonderies ainsi que des usines en général en Amérique). M. Brasseur. A study of American methods compared with French practice. 6000 w. Rev de Metall—Aug., 1913. No. 45317 H.

Foundry Output and Convenient Arrangement. Henry Marquette Lane. Discusses the effect of arrangement upon the output. 1500 w. Ir Age—Oct. 9, 1913. No. 45764 C.

Success in Foundry Operation Not Simple. Ward H. Dean. Gives examples of failures, explaining their causes. 2200 w. Ir Age—Oct. 9, 1913. No. 45765 C.

Consult Classification of the Index. See page 9.

Foundry Fuel

See same heading, under *Heating and Cooling*, and *Fire Prevention*, under *Civil Engineering, Construction*.

Foundry Fuel

See *Fuel Oils*, under *Steam Engineering*.

Foundry Heating

See *Foundries*, under *Heating and Cooling*.

Foundry Laboratory

Some Short Cuts in the Foundry Laboratory. P. A. Boeck. Considers some of the approved forms of apparatus for research work. Ills. 3500 w. Am Found Assn—Dec., 1912. No. 88618 N.

Foundry Lighting

The Artificial Lighting of Iron Foundries. D. R. Wilson. From report for 1912 of the Chief Inspector of Factories and Workshops. Discusses the general characteristics and gives results of observations. 1200 w. Mech Engr—July 4, 1913. No. 43714 A.

Foundry Losses

Recovery of Shot in Small Foundries. S. A. Capron. Describes a device consisting of two sets of belts running in parallel planes. Electric magnets gather the lost metal, and conveyor belts deposit and sort the material. Ills. 600 w. Am Found Assn—Dec., 1912. No. 38604 N.

Foundry Mixtures

The Use of Mayari Iron in Foundry Mixture. Quincy Bent. Illustrated report of results obtained by the use of pig iron made from Cuban ore, in the production of close-grained and chilled gray iron sections. 2500 w. Ir Trd Rev—Oct. 31, 1912. No. 37181.

Use of Mayari Iron in Foundry Mixtures. Quincy Bent. Read before the Am. Ir. & St. Inst. Deals with the preparation and use of the ore in the blast furnace, the chilling, tensile, transverse, hardness and machining tests of castings. Ills. 3000 w. Ir Age—Oct. 31, 1912. No. 37744 C.

Foundry Operations

The Great Economies Produced by Continuous Foundry Installations. George K. Hooper. Discusses results obtained by the use of the continuous method. 3000 w. Am Found Assn—Dec., 1912. No. 38602 N.

Foundry Power

Economical Motive Power in the Foundry (Wirtschaftlichkeit von Kraftwerksantrieben für Hüttenwerke). M. Gercke. Discusses the growth and practicability of steam turbines, large gas engine and Diesel engines in foundry work. Ills. Serial, 1st part. 2300 w. Stahl u Eisen—June 12, 1913. No. 43505 D.

MACHINE WORKS AND FOUNDRIES**Foundry Scrap**

The Power Question in Foundry Work (Ueber Antriebsfragen in Hüttenwerken). G. Stauber. A comparison of the cost and service from gas power and turbine power, including some opinions on the Bone combustion methods. Serial, 1st part. 4000 w. Stahl u Eisen—Aug. 14, 1913. No. 45376 D.

Foundry Practice

Foundry Wastes (Giesserei-Ausschuss). Oskar Leyde. Suggestions for tabulated forms in keeping track of wastes of all sorts. 3500 w. Giesserei-Zeitung—Oct. 1, 1912. No. 37413 D.

The Importance of Dispatching in the Foundry. C. E. Knoepfel. An outline of management aiming at efficiency. 3000 w. Am Found Assn—Dec., 1912. No. 38605 N.

Some Salient Points in the Modern Steel Foundry. Samuel R. Robinson. Describes advancement made in the different departments of the steel foundry in recent years. 1200 w. Am Found Assn—Dec., 1912. No. 38606 N.

Creation and Loss of Arts and Skill in Founding. Thomas D. West. Read before the New England Found. Assn. Discusses changed conditions. 4500 w. Engng—Jan. 17, 1913. No. 39482 A.

Smelting Methods in the Foundry (Der Schmelzbetrieb in der Eisengiesserei). Herr Mehrrens. A review of furnaces, presses and practice in modern foundries. Ills. 5000 w. Zeit des Oest Ing u Arch Ver—Jan. 24, 1913. No. 40547 D.

Foundry Tests and Foundry Practice. W. R. Dean. Suggestions helpful in determining the quality of the metal. 1500 w. Am Inst of Metals—Sept., 1912. No. 43289 N.

Features of American Core Room Practice. Henry M. Lane. A comparison of methods in French and American foundries. Discusses core binders, core baking and core machines. 4500 w. Ir Age—Aug. 21, 1913. No. 44489 C.

Rational Smelting and Founding in Metal Work (Rationelles Schmelzen und Giessen in der Metallgiesserei). K. Hunger. An explanation of the fundamental principles involved. Serial, 1st part. 2500 w. Giess Zeit—July 15, 1913. No. 44625 D.

Overland Company's Aluminum Foundry. Illustrates and describes the modern methods of molding and casting. 1500 w. Automobile—Sept. 11, 1913. No. 45106.

Foundry Scrap

Efficient Organization for Handling Salvage. H. C. Pearce. Urges the establishment of a systematic plan for reclaiming serviceable material and of

Foundry Shifts

marketing scrap to advantage. 3000 w. Ry Age Gaz—Dec. 13, 1912. No. 38186.

Foundry Shifts

The Eight-Hour Shift in the Steel Foundry. R. A. Bull. A statement of results obtained in open-hearth furnace operation. 2500 w. Foundry—Nov., 1912. No. 37230.

Foundry Training

Foundry Training in the Higher Trade Schools. Dr. Otto Brandt. Abstract translation. A review and comparison of German and American foundry schools. 2000 w. Am Found Assn—Aug., 1913. No. 44741 N.

Foundry Transporters

Recent Foundry Transporters (Neuere Giesswagen). Description of some electrically driven floor transporters. Ills. 2000 w. Stahl u Eisen—Oct. 17, 1912. No. 37405 D.

Modern Transporter Systems for Foundries (Moderni impianti di trasporto per fonderie). Hubert Hermanns. Typical plans for installations, and recent types. Ills. Serial. 1st part. 1800 w. Industria—Feb. 23, 1913. No. 40614 D.

Electric Iron-Ore Transport for the Rombach Foundry (Elektrische Eisenerztransportbahnen der Rombacher Hüttenwerke). Herr Schroedter. Details of electric railway system used in connection with this plant. Ills. Serial. 1st part. 6500 w. Elek Kraft u Bahnen—Dec. 14, 1912. No. 39050 D.

Foundry Valuation

A New Test for the Valuation of Foundry Production (Ein neues Wertberechnungsverfahren für Giessereierzeugnisse). Carl Rein. The development of formulae and tables in the determination of valuation. Discussion. 3500 w. Stahl u Eisen—July 31, 1913. No. 44610 D.

Furnace Chargers

Mechanical Cupola Charging (Mechanische Kupolofenbeschickung). E. Vorbach. A review of authoritative opinions as expressed in various articles. Serial. 1st part. 1400 w. Giess Zeit—Feb. 1, 1913. No. 40516 D.

Furnace Charging Machines with Special Reference to Open Hearth Work. J. Smith. Illustrated detailed description of various forms of machines. 1500 w. Elect'n Lond—Dec. 13, 1912. (Special.) No. 38856 D.

Furnace Foundations

Heavy Concrete Foundations in Foundry Shops (Schwere Betonfundierungen auf Hüttenwerken). W. Schömburg. Plans and details of footings for shops, cooling rooms and furnaces. Ills. 2200

MACHINE WORKS AND FOUNDRIES**Furnaces**

w. Beton u Eisen—Sept. 13, 1913. No. 46029 E.

Furnace Fuels

Oil Firing, with Especial Regard to Oil-Fired Smelting Furnaces and Oil Burners for Foundry Work (Ueber Oelfeuerung mit besonderer Berücksichtigung der ölgefeuerten Schmelzöfen und der Oelbrenner für den Giessereibetrieb). Wilhelm Venator. Quality of oil, burner design, layout of piping and tanks, etc. Serial. 1st part. 1600 w. Giess Zeit—Feb. 15, 1913. No. 40518 D.

Kerosene for Steel Heating Furnaces. Harry C. Spillman. Describes the arrangement of a well-equipped heat-treating department and discusses the comparative values of fuel oil and kerosene. 1200 w. Mach, N Y—Oct., 1913. No. 45610 C.

The Use of Pulverized Coal as a Fuel for Metallurgical Furnaces. H. R. Barnhurst. A study of the availability of pulverized coal as a fuel, the proper method of firing, the control of fuel and air, and factors necessary for success. 4500 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46353 F.

Furnace Heating

The Use of Heavy Oil in the Heating of Metallurgical Furnaces (L'application du chauffage à l'huile lourde aux fours métallurgiques). M. Brasseur. Comparative cost with electric furnaces and some actual experiences. 3800 w. Rev de Metall—Aug., 1913. No. 45318 H.

See also Gas Producers, under MINING AND METALLURGY, Coal and Coke.

Furnaces

Furnace Efficiency. Joseph Harrington. Aims to show the insufficiency of the usual method of analysis, and to present a method by which the efficiency of the elements themselves can be determined, and errors corrected. 11500 w. Jour W Soc of Engrs—Nov., 1912. No. 38561 D.

The Design of Ignition Arches. Joseph Harrington. Discusses principles underlying their design, and compares flat arches with sprung arches. Ills. 1800 w. Power—Dec. 10, 1912. No. 38101.

The Charcoal Furnace of the East Hampton, Connecticut, Bell Makers; Its History, Uses and Advantages. Erwin S. Sperry. Illustrates and describes this charcoal furnace and its work, and gives information concerning the bells manufactured. 3000 w. Brass Wld—Jan., 1913. No. 39344.

The "Gamm" Oil Reverberatory Furnace for Melting Nickel. Illustrated description of this furnace and its working. 1500 w. Brass Wld—Feb., 1913. No. 40146.

Consult Classification of the Index. See page 9.

Furnaces

Cost of Running Annealing and Heating Furnaces. J. Lord. Abstract of a lecture at the Roy. Tech. College, Glasgow. Considers different designs of furnaces operated by four kinds of fuel and their cost of running. 2000 w. *Ir & Coal Trds Rev*—March 14, 1913. No. 40835 A.

Improvements in Furnace Equipment for Solid Fuels (Neuerungen bei Feuerungsanlagen für feste Brennstoffe). Herr. Pradel. Recent improvements in design, charging devices, draft regulators, etc. Ills. 4000 w. *Feuerungs*—April 1, 1913. No. 41442 D.

Principles for the Correct Design of Furnace Plants (Grundlagen für das richtige Entwerfen von Ofenanlagen). From an article by W. E. Grum-Grzmailo. A series of suggested plans. Ills. Serial. 1st part. 2000 w. *Stahl u Eisen*—May 22, 1913. No. 43003 D.

Improvements in Oil Firing with Special Reference to the Buess Oil-Fired Furnace (Fortschritte auf dem Gebiet der Oelfeuerung unter besonderer Berücksichtigung der Oelschmelzöfen System Buess). P. Lennings. A description of the Buess system and its practical application. Ills. 7000 w. *Giess Zeit*—May 15, 1913. No. 43004 D.

Handling Cheap Furnace Work with Profit. Explains shop methods employed to eliminate waste motion in low-priced installations. 2200 w. *Met Work*—Aug. 15, 1913. No. 44436.

The Present Status of the Reheating Furnace Question (Ueber den heutigen Stand der Tiefofenfrage). F. Schruff. A review of recent patents and their description. Ills. Serial, 1st part. 2200 w. *Stahl u Eisen*—July 3, 1913. No. 44601 D.

The Life of Crucible Steel Furnaces. John Howe Hall. Information concerning the life of crucible furnaces and the factors that determine it. 1000 w. *Bul Am Inst of Min Engrs*—Sept., 1913. No. 45472 F.

Electric Furnaces in Iron and Brass Foundries. E. Kilburn Scott. Discusses the possibilities of this new type of melting equipment. 3000 w. *Foundry*—Sept., 1913. No. 44860.

Investigations on a McLean Furnace (Untersuchungen an einer McLean'schen Feuerung). E. Schilling. Description of this type of furnace and results of some experiments. Ills. Serial, 1st part. 2700 w. *Feuerungs*—Sept. 1, 1913. No. 46064 D.

A Comparison of Two Puddling Furnaces and Their Economy from a Chemical Viewpoint (Gegenüberstellung zweier

MACHINE WORKS AND FOUNDRIES

Grinding

Puddelofensysteme und ihre vom chemischen Gesichtspunkte aus betrachtete Wirtschaftlichkeit). Herr Milke. The ordinary system compared with the Pietzka patent. Ills. 2800 w. *Giess Zeit*—Sept. 1, 1913. No. 46020 D.

See also Tar, under *Materials of Construction*, and *Electric Furnaces*, under *ELECTRICAL ENGINEERING, Electro-Chemistry*.

Galvanizing

Galvanizing Tubes by Machinery. N. Buchert. Trans. from *Stahl und Eisen*. Illustrates and describes details of the apparatus used. 800 w. *Ir & Coal Trds Rev*—Nov. 8, 1912. No. 37652 A.

"About Sherardizing." Thomas Liggett, Jr. An account of the discovery of this process of galvanizing, describing the apparatus needed and the application of the process and giving related information. Ills. 2500 w. *Am Found Assn*—Dec., 1912. No. 38603 N.

Old and New Methods in Galvanizing Aluminum (Altes und Neues ueber die Galvanisierung des Aluminiums). Dr. F. Regelsberger. Describes the several methods. Serial. 1st part. 2000 w. *Elektrochem Zeit*—Oct., 1912. No. 38462 D.

A New Pickling and Galvanizing Plant. Illustrates and describes improvements introduced in the sheet mill of the Brier Hill Steel Co., at Niles, Ohio. 1000 w. *Ir Age*—July 31, 1913. No. 44103 C.

The Electro-Galvanizing Process. Seymour W. Rowsbar. Describes and compares the processes used. 3500 w. *Foundry*—Oct., 1913. Special. No. 45709 C.

See Galvanized Iron, under *Materials of Construction*.

Gauges

Limit Gauges. Walter Heap. Shows the importance of limit gauges, and that it is unnecessary to aim at extreme accuracy. 2000 w. *Mech Wld*—March 28, 1913. No. 41138 A.

Gear Cutting

An Early Automatic Gear Cutting Machine. Douglas T. Hamilton. An illustrated record of improvements made in gear cutting machinery in the shops of R. Hoe & Co., New York. 3000 w. *Mach, N Y*—Sept., 1913. No. 44840 C.

Inspection Tests for Cincinnati Gear-Cutting Machines. Illustrates and describes methods of testing alignment of parts while gear-cutting machines are being assembled. 800 w. *Mach, N Y*—Oct., 1913. No. 45604 C.

See also Gears, under *Machine Elements and Design*.

Grinding

Grinding Wheels and Safety of Opera-

Consult Classification of the Index. See page 9.

Grinding

MACHINE WORKS AND FOUNDRIES

Krupp Centennial

tion. Issued by Travellers Ins. Co., Hartford, Conn. Illustrates and describes methods of protecting human life and limb. 2500 w. Sci Am Sup—Nov. 23, 1912. No. 37736.

Plain Cylindrical Grinders. Describes machines exhibited at the Olympia Exposition. 2500 w. Prac Engr—Nov. 7, 1912. No. 37623 A.

Grinding Practice in Foundries of the United States (Zur Schleiftechnik in den Giessereibetrieben der Vereinigten Staaten von Nordamerika). C. Krug. Illustrates various types of mountings in some large American plants. 2100 w. Stahl u Eisen—Nov. 28, 1912. No. 38410 D.

The Bryant Chucking Grinder. Illustrated description of a combined hole and face grinder manufactured in Springfield, U. S. A., and shown at the Olympia Exhibition. 600 w. Engng—Jan. 17, 1913. No. 39478. A

The Queen City Cylindrical Grinder. Illustrated description of a design having a stationary work table and traversing wheel base. 1800 w. Am Mach—Jan. 9, 1913. No. 38940.

Specifications for Exhaust System for Grinding, Polishing, and Buffing Wheels. Gives specifications compiled by William Newell and issued by the New York State Department of Labor. Aims to bring about the efficient removal of dust. 1800 w. Brass Wld—April, 1913. No. 41579.

Grinding Wheel Sparks. R. G. Williams. Illustrated discussion of spark characteristics and what they indicate. 1800 w. Sci Am Sup—May 10, 1913. No. 41913.

Modern Methods of Grinding. Edward W. Dodge. Remarks on the extent to which we are indebted to grinding machines, and on their manufacture and use. Discussion. 5000 w. Pro S & S-W Ry Club—March, 1913. No. 42399 C.

Large Plain Grinding Machine. Illustrated description of a machine claiming to be the largest of its class yet built. 1000 w. Engr, Lond—June 20, 1913. No. 43393 A.

Grinding Rolls and Other Cylindrical Sections. Illustrated description of a new tool, motor-driven throughout, built by the Norton Grinding Co. 2000 w. Ir Trd Rev—July 31, 1913. No. 44101.

See also Exhaust Systems, under *Machine Works and Foundries*.

Grinding Machines

New Grinding Machines for Locomotive Repairs (Neue Schleifmaschinen für den Lokomotivausbesserung). Herr Pontani. Description of several new German machines for grinding flat slide valves and

axle boxes. Ills. 2200 w. Glaser's Ann—Oct. 1, 1913. No. 46017 D.

Guideways

Adjustable Guide-Strips. W. A. Field. Illustrated description of vee-strips and of square guides. 1200 w. Mech Wld—June 13, 1913. No. 43139 A.

Hardening

See same heading, under **MINING AND METALLURGY, Iron and Steel**.

Heading Machines

See Cold-Heading, under *Machine Works and Foundries*.

Indexing

Differential Indexing. A. R. Packard. Explains this method. 1500 w. Am Mach—Dec. 19, 1912. No. 38265.

A New Method of Indexing on the Universal Milling Machine. George W. Burley. Briefly describes the different methods used, and also the proposed new method. 3000 w. Prac Engr—Dec. 12, 1912. No. 38390 A.

Industrial Plants

Layout, Design and Equipment of Industrial Plants. A. Home-Morton. Extracts from a paper read before the Liverpool Engng. Soc. Discusses arrangements to secure efficiency and economy, processes and routing of work, and transmission of power. 1500 w. Can Engr—June 19, 1913. No. 42994.

Ironfoundry

Commencing a Small Ironfoundry. E. Henderson. From a paper read before the British Found. Assoc. Suggestions for the location, construction, power, equipment, etc. 3000 w. Mech Wld—May 30, 1913. No. 42774 A.

Jarring Machines

A New German Jarring Machine (Eine neue deutsche Rüttelformmaschine). Jakob Leber. A device for the molding-room, giving noteworthy results in actual practice. Ills. 3500 w. Stahl u Eisen—March 27, 1913. No. 41408 D.

Jigs

Jig for Milling an Irregular Shaped Guide. Christian F. Meyer. Illustrated detailed description of the jig and its operation. 1000 w. Mach, N Y—Jan., 1913. No. 38723 C.

A Universal Drill Jig. Christian F. Meyer. Drawings and description of a design intended to handle castings, having a round boss on one side. 700 w. Mach, N Y—Sept., 1913. No. 44838 C.

Krupp Centennial

The Centenary of the Krupp Works (Le Centenaire des Usines Krupp). A. Bidault des Chaumes. Brief description of the plant covering the Essen steel works, the Rheinhausen blast-furnaces, the Germania navy yard, etc. Ills. 6400

Lathe Fittings

w. Genie Civil—Oct. 12, 1912. No. 37514 D.

Lathe Fittings

Lathe Centres and Allied Fittings. Deals with centres and fittings connected therewith. Ills. 1000 w. Mech Wld—Feb. 28, 1913. No. 40480 A.

Lathes

A Few Hints on Buying a Lathe. F. R. Parsons. 1600 w. Prac Engr—Dec. 26, 1912. No. 38873 A.

Bullard 36-Inch Vertical Turret Lathe. Illustrates and describes the interesting features of the design. 2500 w. Am Mach—Jan. 16, 1913. No. 39122.

Developing the Engine Lathe in an Auto Shop. Fred H. Colvin. Gives examples of turning in which the engine lathe has saved money over more expensive machines. Ills. 1200 w. Am Mach—Jan. 16, 1913. Serial. 1st part. No. 39123.

Lathe Setting and Testing. T. G. Gray. Suggestions for the inspection and testing. Ills. 2000 w. Mech Wld—Jan. 3, 1913. Serial. 1st part. No. 39149 A.

Design Analysis of Small Engine Lathes. E. H. Fish. Gives a complete analysis of the designs of eight representative engine lathes. Ills. 8000 w. Am Mach—Feb. 6, 1913. No. 39671.

Electrically Driven High-Speed Turning Lathe at H. Wohlenberg in Hannover (Neue Schnelldrehanbank mit elektrischem Antrieb von H. Wohlenberg in Hannover). F. Nickel. Details of new motor-driven lathe. Ills. 2000 w. Zeitschr des Ver deutscher Ing—Jan. 4, 1913. No. 40037 D.

The Relieving or Backing-Off Lathe. George W. Burley. Explains the principle underlying the action of these machine tools. Ills. 3000 w. Prac Engr—Feb. 20, 1913. No. 40309 A.

A Basis for Measuring Lathe Capacity. L. R. Pomeroy. Considers methods devised by J. T. Nicolson. The value of torque at one foot radius gives a correct estimate of the metal removing capacity. 1800 w. Am Engr—March, 1913. No. 40342 C.

Brass-Finisher's Plugging Lathe. Illustrated description of details of this English lathe and its attachments. 1500 w. Engng—April 18, 1913. No. 41769 A.

The Lathe as a Machine Tool. J. D. Smith. Shows the possibilities of a lathe in a small shop. 1800 w. Prac Engr—May 1, 1913. No. 41919 A.

The New Selective Head Lathe. Illustrated description of a new lathe built in Cincinnati. The selective type of automobile transmission has been adopted for

MACHINE WORKS AND FOUNDRIES

Machine Attachments

the gear box drive. 1500 w. Ir Age—June 26, 1913. No. 43239 C.

A 50-Inch Gun Lathe. Illustrated description of a lathe built to meet the latest requirements of ordnance construction. 800 w. Engr, Lond—June 6, 1913. No. 42892 A.

Designing Faceplate Jaws and Screws for a Heavy Lathe. W. G. Dunkley. An analysis of stresses and determination of dimensions to resist them. 1700 w. Mach, N Y—June, 1913. No. 42569 C.

74-In. Centre Motor Driven Screw-Cutting Break Lathe. Illustrates and describes a quadruple-gear surface and screw-cutting break lathe. Plate. 800 w. Engng—July 4, 1913. No. 43718 A.

Manufacturing Greaves-Klusman Engine Lathes. Douglas T. Hamilton. Illustrates and describes some tools and methods employed in making gear-boxes, aprons, &c. 3000 w. Mach, N Y—Aug., 1913. No. 44084 C.

A New Combination Turret Lathe. Illustrated description of a new pattern embodying features of interest. 1000 w. Engr, Lond—Sept. 12, 1913. No. 45406 A.

Gun Lathe and Boring-Machine. Illustrated description of an exceptionally large combined gun-turning lathe and boring-machine. 1200 w. Engng—Aug. 22, 1913. No. 44920 A.

14-In. Swing "Apollo" Combination Turret Lathe. Illustrated description of a machine built in Manchester, Eng. 2200 w. Engng—Oct. 10, 1913. No. 45983 A.

Lathe Work

Efficient Production of Cylindrical Work. Shows how efficiency can be increased by rough lathe turning preparatory to cylindrical grinding. Ills. 3000 w. Mach, N Y—Dec., 1912. No. 37986 C.

Efficient Production of Cylindrical Work. C. H. Norton. Discussing grinding and turning, showing that the highest efficiency is secured by using the lathe as a roughing tool, and transferring the refining to the grinding machine. Ills. 3500 w. Jour Am Soc of Mech Engrs—Jan., 1913. No. 39352 D.

Efficient Production of Cylindrical Work. A discussion of C. H. Norton's paper. 800 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41299 D.

See also Grinding, under *Machine Works and Foundries*.

Machine Attachments

Cross-Drilling and Milling Attachments. Douglas T. Hamilton. Illustrated description of attachments applied to the "Acme" multiple-spindle automatic screw machine. 2000 w. Mach, N Y—April, 1913. No. 40983 C.

Consult Classification of the Index. See page 9.

Machinery Purchases

MACHINE WORKS AND FOUNDRIES

Machining

Machinery Purchases

Following Up the Purchase and Installation of Machinery. Alden W. Welch. Explains a system for supervising and following up the purchase and installation of machines. 3000 w. Engng Mag—Aug, 1913. No. 43913 B.

Machine Supports

Machine and Work Centres. George W. Burley. Drawings and discussion of supporting centres of machine tools. 1200 w. Prac Engr—March 27, 1913. Serial. 1st part. No. 41005 A.

Machine Tools

The New Era in Machine Tool Design. E. P. Bullard, Jr. Address to the Cleveland Engng. Soc. (Abstract.) Discusses what must be done to secure efficient tools. 2500 w. Ir Age—Dec. 12, 1912. No. 38168 C.

The New Era in Machine Tool Design. E. P. Bullard, Jr. Abstract of a lecture before the Cleveland Engng. Soc. A review of improvements in design which promote productivity, durability and adaptability. 5000 w. Mach, N Y—Jan., 1913. No. 38730 C.

The New Era in Machine Tool Design. E. P. Bullard, Jr. Remarks on present-day requirements and the importance of analysis of the work to be done and the conditions to be met, discussing the essentials of machine tool design. Ills. 8500 w. Jour Cleveland Engng Soc—March 1, 1913. No. 40865 C.

A Powerful Slotting Machine. Illustrations, with description, of a machine built in Leeds, Eng. 2000 w. Engr, Lond—Dec. 6, 1912. No. 38249 A.

Chilled Cast Iron Used for Machine Tools. Henry M. Wood. Explains the advantages of chilled ways for lathe beds. Ills. 2000 w. Am Mach—Jan. 23, 1913. No. 39285.

The Capacity of Metal Working Machines. Stuart Dean. Fifteenth article of a series on Shop and Foundry Management. Considers ways of learning about feeds and speeds. 1800 w. Ir Age—Feb. 20, 1913. No. 39927 C.

Methods of Lubricating Machine Tools. Joseph Horner. Illustrated review of oiling devices and systems of distribution. 5000 w. Mach, N Y—Feb., 1913. Serial, 1st part. No. 39603 C.

Milling Machines. Irvin Haworth. Describes these machines and their use. 1800 w. Mech Wld—Feb. 14, 1913. Serial, 1st part. No. 40123 A.

Machine-Tool Reverses. Hubert Bentley. Illustrated study of the various methods adopted in machine-tool practice. 1200 w. Mech Wld—April 11, 1913. No. 41384 A.

International Exposition of Machine Tools (Exposition internationale de machines-outils). F. Hofer. Illustrated description of some of the machines exhibited at the Olympia Show, London, October, 1912. Serial. 1st part. 3500 w. Genie Civil—March 29, 1913. No. 41526 D.

Power Requirements for Machine Tools. Harry C. Spillman. A summary of tests made to determine power consumption of machine tools. Ills. 1200 w. Macu, N Y—June, 1913. No. 42570 C.

Machine for Heavy Boring, Drilling and Tapping. Illustrated description of a machine driven by a variable speed motor. 500 w. Engng—May 30, 1913. No. 42783 A.

Modern Machine Tools for the Working of Metals (Les Machines-outils modernes pour le travail des métaux). E. Gay. Brief descriptions of milling machines, gear-cutting machines, etc. Ills. 4500 w. Tech Mod—June 1, 1913. No. 43071 D.

Speeds and Feeds for Machine Tools. Robert Thurston Kent. Discusses why and how standardization in this respect should be agreed to by machine tool builders. 2500 w. Ir Age—July 3, 1913. No. 43451 C.

Heavy Tools for Machining Turbine Sections. C. Van Langendonck. Describes details of the construction of large German machine tools especially designed for turbine work. Ills. 1000 w. Ir Trd Rev—July 17, 1913. No. 43776.

Brown's Worm Wheel Generating Machine. Illustrated description of a design in which means are provided for disconnecting the lathe from its drive and rotating freely by hand. 900 w. Mech Engr—June 27, 1913. No. 43635 A.

Testing Machine Tools (Das Prüfen von Werkzeugmaschinen). Rudolf Langer. A review of the precise tests made by manufacturers in the construction of the machines. Ills. 3300 w. Zeit des Oest Ing u Arch Ver—July 25, 1913. No. 46046 D.

See also Motor Drive, under *Power and Transmission*.

Machining

Machining Gas Tractor Parts by Novel Methods. Illustrates and describes how a Minneapolis shop was rearranged to facilitate production, and the equipment installed. 2000 w. Ir Trd Rev—March 13, 1913. No. 40629.

The Economical Machining of Plane Surfaces. W. A. Field. Explains the manner in which certain factors tend to influence the rate of output and quality of work when machining flat surfaces.

Consult Classification of the Index. See page 9.

Malleable Foundries**MACHINE WORKS AND FOUNDRIES****Molding**

2500 w. Mech Wld—April 4, 1913. No. 41230 A.

Malleable Foundries

Some of the Troubles of Malleable Foundries. Richard Moldenke. Read before the Am. Found. Assn. Explains difficulties in making "low" and "high" irons, discussing the melting problem and annealing. 3500 w. Ir Age—Oct. 23, 1913. No. 46125 C.

Malleable Troubles. Dr. Richard Moldenke. Enumerates the more prominent "malleable troubles," locating their causes and suggesting the cure. 3500 w. Am Found Assn—Oct., 1913. No. 46272 N.

See also Castings, under *Machine Works and Foundries*.

Metal Coating

A New Process for Coating Surfaces with Metal. Dr. Lach. Illustrated description of coating by means of a spray of finely divided metal. 2000 w. Sci Am Sup—Aug. 16, 1913. No. 44356.

The Schoop Metal Spraying Process with Particular Reference to Its Possible Utility in Foundry Work (Das Schoop'sche Metallspritzverfahren mit besonderer Berücksichtigung der Anwendungsmöglichkeiten in der Giessereifach). E. U. Schoop. The principles of the process and its application in case-hardening. Ills. Serial, 1st part. 2300 w. Glass Zeit—June 15, 1913. No. 43503 D.

Metal Coloring

Artificial Metal Coloring (Die künstliche Färbung der Metalle). H. Krause. An outline of the chemical ingredients in use. Serial. 1st part. 2400 w. Glass Zeit. March 1, 1913. No. 40521 D.

Coloring Iron and Steel Products. E. F. Lake. Deals with processes of metal coloring, preparing the work, pickling, etc. 3000 w. Mach, N. Y.—June, 1913. No. 42672 C.

Coloring Non-Ferrous Metals and Alloys. E. F. Lake. Gives directions for the work and receipts for producing different colors. 4500 w. Mach, N. Y.—Sept. 1913. No. 44843 C.

Metal Cutters

Automatic Train-Shears for Cutting Small Bars (Selbsttätige Feineisen-Streckenschere). Arthur Quoilin. Describes machine and its operation. Ills. 1300 w. Stahl u Eisen—Nov. 21, 1912. No. 38408 D.

Metal Cutting

Cold Saw Data from Makers and Users. Describes practice of reliable firms. 2200 w. Am Mach—Nov. 28, 1912. No. 37888.

Milling

Milling Sad Irons. Brief illustrated description of the application of the Becker vertical type of milling machine to the

making of sad iron bases. 800 w. Mach, N. Y.—Nov., 1912. No. 37164 C.

Milling Cutters

Milling Cutters at the Machine Shop and Foundry of Droop & Rein, Bielefeld (Die Fräsmaschinen der Werkzeugmaschinenfabrik und Eisengiesserei von Droop & Rein in Bielefeld). F. Nickel. Detailed illustrated description of the various types of cutters used at this plant. Plates. 5400 w. Zeitschr des Ver deutscher Ing—Dec. 7, 1912. No. 39031 D.

The Cutting Proportions of Milling Cutters (Ueber die Schnittverhältnisse von Fräsern). Josef Szentgyörgyi. Ratios for the proper design of the teeth. Ills. Serial. 1st part. 3800 w. Zeit f Werkzeug — March 15, 1913. No. 41503 D.

The Formation of Radial Milling-Cutter Teeth. George W. Burley. Drawings and description of the method used. 1500 w. Mech Wld—May 23, 1913. Serial. 1st part. No. 42751 A.

Milling Machines

Some Milling Experiments. P. V. Vernon. Abstract of a paper read before the Manchester Assn. of Engrs. Report of experiments aiming at improvements in the machine. Ills. 3500 w. Mech Engr—Nov. 29, 1912. No. 38121 A.

Universal Boring and Milling Machine with Internal Spindle. Illustrations with brief description. 300 w. Engng—Dec. 6, 1912. No. 38245 A.

High Power Milling. H. Pearman. Discusses how to get the best results on present day machines. 1500 w. Prac Engr—Dec. 12, 1912. No. 38391 A.

Milling Machines. Illustrates and describes types. 5000 w. Mech Wld—July 18, 1913. No. 43960 A.

Rapid Production with Milling Machines. Illustrated description of quickly adjusted fixtures for high production metal working machines. 800 w. Ir Age—Aug. 7, 1913. No. 44200 C.

An Italian Milling Machine. Joseph Horner. Brief illustrated description of a machine in which both speed and feed changes are derived from the same gear box. 1000 w. Mach, N. Y.—Oct., 1913. No. 45606 C.

The New Reinecker Vertical Milling Machine (Die neue Senkrecht-Fräsmaschine von J. E. Reinecker A.-G. in Chemnitz-Gablenz). F. Nickel. Details of design and construction of these machines with notes of their adaptability. Ills. and Plate. 2700 w. Zeit des Ver deutscher Ing—Sept. 6, 1913. No. 46037 D.

Molding

Molding Practice for Large Steel Cast-

Consult Classification of the Index. See page 9.

Molding

MACHINE WORKS AND FOUNDRIES

Molding Machines

ings. Illustrates and describes methods used in a foundry at East Chicago, Ind. 1800 w. Foundry—Nov., 1912. No. 37232.

Molding Large Cast Steel Gears by Machine. Illustrates and describes details of the work. 1500 w. Foundry—Nov., 1912. No. 37229.

A New Moulding Machine. Illustrated description of a new machine of British make, intended to meet the requirements of foundries producing high grade castings. 800 w. Engr, Lond—Nov. 8, 1912. No. 37650 A.

The Molding of Screw Propellers. J. Stormonth, Jr. Illustrated detailed description of methods used. 2000 w. Mech Wld—Nov. 15, 1912. Serial. 1st part. No. 37819 A.

Molding and Casting Conveyor Worms (Formen und Giessen von Transportschnecken). N. Ifkowsch. Presents suggestions for these difficult castings. Ills. 1500 w. Giess-Zeit—Dec. 1, 1912. No. 38425 D.

A Foundry with Continuous Molding Units. Illustrated description of a castings plant at Cornwells, Pa. Cupola charging and gas power plant among the features. 6000 w. Ir Age—Jan. 2, 1913. No. 38757 C.

Molding Gas Engine Cylinders for Motor Cars. Illustrates and describes methods pursued in a foundry at Muskegon, Mich. 2500 w. Foundry—Jan., 1913. No. 38706.

Standard Turbine Cylinder Molding Practice. C. A. Tupper. Illustrates and describes economical methods used by the Allis-Chalmers Co. 2000 w. Foundry—Feb., 1913. No. 39650.

Lugs, Facings and Bosses. Francis W. Shaw. Suggestions for designers, pattern-makers, molders, etc. 800 w. Sci Am Sup—Feb. 15, 1913. No. 39889.

Rational Molding Procedure (Rationelle Formverfahren). P. Breidenbach. Machine parts and steps to be followed in molding work. Ills. Serial. 1st part. 1200 w. Giess Zeit—Feb. 1, 1913. No. 40517 D.

Molding Large Iron Generator Field Frames. Illustrates and describes how these castings were made true to the pattern and without distortion. 1000 w. Foundry—June, 1913. No. 42596.

The Hydrostatic Pressure on Molds and Cores. R. R. McGowan. Methods of figuring the pressure of the metal on various types of molds and semi- and fully-submerged cores. 2500 w. Foundry—June, 1913. No. 42598.

The Molding of Bronze Plaques. Directions for the work. Ills. 2500 w.

Brass Wld—June, 1913. No. 42945.

"Drawbacks" in Hand-Molding. Walter J. May. Suggestions for this kind of work. 1000 w. Mech Wld—June 20, 1913. No. 43382 A.

Plate-moulding. Illustrates and describes examples. 2000 w. Mech Wld—July 4, 1913. No. 43716 A.

See also Trade Schools, under INDUSTRIAL ECONOMY.

Molding Machines

Recent American Jarring Machines (Neuere amerikanische Rüttelformmaschinen). U. Lohse. Describes the Herman bumper, and explains action. Ills. Serial. 1st part. 2100 w. Giess-Zeit—Nov. 1, 1912. No. 38423 D.

Rational Molding Practice (Rationelle Formverfahren). P. Breidenbach. Detailed description of a molding press adapted from the Bonvillain system. Ills. Serial. 1st part. 1200 w. Giess Zeit—April 1, 1913. No. 41427 D.

Modern Molding Machines, with Especial Attention to the Latest Jarring Machines (Moderne Formmaschinen unter besonderer Berücksichtigung der neuesten Rüttelformmaschinen). O. Dahlmeyer. Discusses the economical and practical advantages attained by the jarring machines. 2800 w. Giess Zeit—March 15, 1913. No. 41424 D.

Molding Machines for Shallow Work. Illustrated description of a machine for this special work constructed by a Paris firm. Plate. 1800 w. Engng—June 20, 1913. No. 43388 A.

Electric Molding Machines (Elektrische Formmaschinen). U. Lohse. A detailed study of various makes of machines, Part 1 taking up the Hannover-Hainholz machines. Ills. Serial, 1st part. 3500 w. Giess Zeit—June 15, 1913. No. 43502 D.

The "Taunton" Mechanical Ram Moulding Machine. Illustrates and describes a machine specially designed for producing moulds from patterns by hand power in such a manner as to compete with machines using hydraulic or pneumatic power. 600 w. Engr, Lond—Aug. 22, 1913. No. 44930 A.

Turnover Molding Machines with Large Stroke (Wendeplattenformmaschinen mit grossem Hub). Herr Hintze. Illustrating and describing new machine with mechanical lift for use with large, high molds. 1700 w. Giess Zeit—Oct. 1, 1913. No. 46026 D.

Examples of Practice in the Use of Jar-Rammed Molds (Anwendungsbeispiele für das Rüttelformverfahren). Bernhard Keller. Illustrating and describing practice in various classes of molds. 3000

Consult Classification of the Index. See page 9.

Molding Sands

MACHINE WORKS AND FOUNDRIES

Pneumatic Hammers

w. Stahl u Eisen—Sept. 25, 1913. No. 45004 D.

The Utility of Permanent Molds in the Iron and Metal Foundry (Die Brauchbarkeit bleibender Gussformen in der Eisen- und Metallgiesserei). J. Mehrten. A citation of examples describing the use and operation of permanent molds. Ills. Serial, 1st part. 1800 w. Giess Zeit—Sept. 15, 1913. No. 46021 D.

See also Castings, under *Machine Works and Foundries*.

Molding Sands

Testing and Valuing Molding Sands. (Prüfung und Bewertung des Formsandes). Carl Buderus. Discusses the desirable qualities of molding sands and presents a new series of tests. Serial. 1st part. 2100 w. Giess-Zeit—Oct. 15, 1912. No. 37415 D.

Mechanical Sand Tempering. V. E. Minich. Describes the devices available for preparing the sand and the results obtained by their use. 3000 w. Am Found Assn—Dec., 1912. No. 38609 N.

Facing Sand. Directions for preparing sand and moulds in order to obtain good castings. 1800 w. Mech Wld—Nov. 29, 1912. No. 38126 A.

An Automatic Plant for Preparing Molding Sand (Eine selbsttätige Anlage zur Aufbereitung von Formsand). C. Geiger. Describes two recent German appliances. Ills. 1400 w. Stahl u Eisen—Dec. 26, 1912. No. 39025 D.

An Automatic Plant for the Preparation of Model and Molding Sand (Eine selbsttätige Aufbereitanlage für Modellsand und Masse). Illustrated description of a new device. 1700 w. Zeit des Ver deutscher Ing—July 5, 1913. No. 44645 D.

Molding Sand. Its Tests and Value (Der Formsand, seine Prüfung und Bewertung). Carl Irresberger. Analytical methods for determining the desirable qualities of the sand. Ills. Serial, 1st part. 3500 w. Stahl u Eisen—Aug. 28, 1913. No. 45380 D.

Resumed Study on Molding Sands and Their Treatment (Étude résumée sur les sables de fonderie et leur traitement). A. L. Curtis. A study of sands from various sources and of many elements, for determining their suitability. 6000 w. Rev de Metall—Aug., 1913. No. 45316 H.

On the Relative Value of Foundry Flour, with Simple Methods of Testing. G. S. Evans. A summary of tests on foundry flours, with specifications for this material, prepared as the result of the investigation. 2000 w. Am Found Assn—Oct., 1913. No. 46268 N.

Pattern Shop

Segmental Work in the Pattern Shop. W. J. Horner. Illustrated description of such work, explaining reasons and advantages. 1000 w. Mech Wld—Aug. 1, 1913. Serial, 1st part. No. 44314 A.

Pickling

Some Present Pickling Methods. Oliver W. Storey. Discusses the need of removing scale, the factors to be considered in laying out a pickling plant, the strength and temperature of pickle and other details. 4000 w. Met & Chem Engng—Jan., 1913. No. 38972 C.

Pipe Cutting

Cutting Pipe and Pipe Threads. W. H. Wakeman. Describes methods of work. Ills. 2200 w. Dom Engng—Nov. 16, 1912. No. 37606.

Pipe Founding

Fixtures for Machining Exhaust Pipes. W. L. Myles. Illustrates and describes special fixtures used for machining a new style of exhaust pipe. 800 w. Mach, N Y—Feb., 1913. No. 39602 C.

New Pipe Founding Methods, Ardel Construction (Ueber neue Röhrengiessereien, Bauart Ardel). Robert Ardel. Description of new plant at Hannover, and the plant at the Ardel Works, Eberswalde, with details of methods. Ills. 2100 w. Stahl u Eisen—Feb. 27, 1913. No. 41401 D.

Pipe Foundry

The Manufacture and Use of Steel Tubing. J. H. Nicholson and Emil Holinger. Detailed explanation of the processes of manufacture, materials, specifications, applications, etc. Ills. 9500 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38303 H.

Pipe Painting

A Unit System of Colors for the Recognition of Piping in Industrial Plants (Einheitsfarben zur Kennzeichnung von Rohrleitungen in industriellen Betrieben). A proposed system to be adopted uniformly in painting pipes for easy recognition; green, for water; yellow, for gas; blue, air; white, steam; red, acid; violet, lye; brown, oil; black, tar, and gray for vacuum. Plate. 1000 w. Stahl u Eisen—March 20, 1913. No. 41406 D.

Planers

Erection and Care of Planers. W. D. Wedmore. Suggestions for planer practice. 1800 w. Prac Engr—Jan. 2, 1913. No. 39142 A.

The Fawcus Herringbone Gear Planer. Illustrated detailed description of this machine. 2000 w. Am Mach—Feb. 20, 1913. No. 39897.

Pneumatic Hammers

Pneumatic Hammers (Marteaux-Pilons)

Consult Classification of the Index. See page 9.

Pneumatic Tools

Pneumatiques). A. Inne. A study of the working action of the hammer, its effectiveness, scope of work, and the various types. Ills. 11,000 w. *Rev de Mecan*—May 31, 1913. No. 43075 E + F.

Pneumatic Tools

Use and Abuse of Pneumatic Tools. From *Granite, Marble and Bronze*. Suggestions for the care of such tools and their repair. 5000 w. *Compressed Air*—Nov., 1912. No. 37797.

Compressed Air as a Foundry Auxiliary. William H. Armstrong. From an address before the Newark, N. J., Found. Assn. Illustrates and describes important applications of pneumatic tools in the making of castings. 3000 w. *Ir Age*—Jan. 19, 1913. No. 39128 C.

Working Tests on a Single-Cylinder Pneumatic Hammer (Verbrauchsversuch an einem Luftdruckhammer mit nur einem Zylinder). Otto Fuchs. A study of time-space curves under varying conditions. Ills. 2700 w. *Zeit des Ver deutscher Ing*—Dec. 28, 1912. No. 39045 D.

Investigations with Pneumatic Tools (Untersuchungen an Pressluftwerkzeugen). R. Harm. Curves for feeds and speeds with the use of compressed air. Ills. 3300 w. *Zeit des Ver deutscher Ing*—Feb. 1, 1913. No. 40533 D.

Experimental and Theoretical Researches on Pneumatic Tools (Experimentelle und theoretische Untersuchungen an Pressluftwerkzeugen). Ernest Groedel. Mathematical discussion. Ills. 2400 w. *Zeit des Ver deutscher Ing*—July 26, 1913. No. 44657 D.

Polishing

Method of Balancing Sander Cylinders. F. E. Schmidt. Illustrates and describes apparatus and methods used. 1500 w. *Am Mach*—Dec. 26, 1912. No. 38544.

The Abbott Ball-Burnishing Process. Chester L. Lucas. Illustrated description of a method of finishing polished work by tumbling. 1000 w. *Mach, N Y*—Dec., 1912. No. 37985 C.

Metal Polishing—Ancient and Modern. Seymour W. Rowsbar. Describes burnishing and polishing methods. 1600 w. *Foundry*—April, 1913. No. 41036.

See also Grinding, under *Machine Works and Foundries*.

Presses

The Bulldozer in Railway Shops. Lewis D. Freeman. An account of experiments recently made with the machine to determine what can be accomplished with two-piece dies. 1200 w. *Am Engr*—Feb., 1913. No. 39721 C.

Research Into the Rudiments of Working Requirements in Press Forging (Über die Grundlagen zur Ermittlung

MACHINE WORKS AND FOUNDRIES

Recovery

des Arbeitsbedarfes beim Schmieden unter der Presse). Fr. Riedel. A study of the pressures required for various duties. Ills. 4400 w. *Zeit des Ver deutscher Ing*—May 31, 1913. No. 43014 D.

Pressed Metal Parts (Metall-Press-teile). Franz Adler. Describes the presses for use with copper and brass and the large scope of their output. Ills. 3500 w. *Zeit des Ver deutscher Ing*—Aug. 30, 1913. No. 46036 D.

See Rivetters, under *Hydraulic Machinery*.

Press Work

Steel Balls as a Press "Working Fluid." Aug. Bauschlicher. The use of steel balls for punch and die work is illustrated and described. 2000 w. *Am Mach*—Nov. 21, 1912. No. 37666.

Modern Methods of a Press Working Plant. Chester L. Lucas. Illustrates and describes work. 1500 w. *Mach, N Y*—Dec., 1912. No. 37983 C.

Projectiles

The Manufacture of Armor-Piercing Projectiles. General Leandro Cubillo. Read before the Iron & Steel Inst. Considers the material used, the process of manufacture, hardening and tempering, and the manufacture of the cap. Ills. 3500 w. *Ir & Coal Trds Rev*—Sept. 5, 1913. No. 45185 A.

Puddling

The Reactions of the Puddling Process. Thomas Turner. Read before the W. of Scotland Ir. & St. Inst. Reviews causes that have affected this industry and considers how far it may be possible to improve on present procedure. 6000 w. *Engng*—Feb. 14, 1913. No. 40134 A.

Reamer-Holders

Floating Reamer-Holders. Albert A. Dowd. Illustrates and describes designs to insure concentricity of work in horizontal and vertical machines. 1800 w. *Mach, N. Y.*—July, 1913. No. 43359 C.

Reamers

Adjustable Reamers. George W. Burley. Drawings and descriptions of type. 1500 w. *Mech Wld*—Nov. 29, 1912. Serial. 1st part. No. 38125 A.

Floating Reamer-Holders. Albert A. Dowd. Illustrates and describes types. 1200 w. *Mech Wld*—Sept. 12, 1913. Serial, 1st part. No. 45295 A.

Fluting an Odd-Sized Spiral-Toothed Tapered Reamer. George W. Burley. Drawings with detailed description of the work. 2000 w. *Mech Wld*—Sept. 5, 1913. No. 45149 A.

Recovery

The Reclamation of Non-Ferrous Metals. Illustrated description of the equipment and practice of the Westinghouse

Repair Shop

MACHINE WORKS AND FOUNDRIES

Screw Machines

Electric & Mfg. Co. for the recovery of copper, tin, and lead. 2500 w. Foundry—April, 1913. No. 41034.

Repair Shop

New York's Meter Repair Shop. Illustrated description of the organization and facilities of the meter repair service of the Consolidated Gas Co. 2500 w. Gas Age—Feb. 15, 1913. No. 39822.

Riveters

See same heading, under *Hydraulic Machinery*.

Rolling Mills

The New Rolling Mill of the Stamford German-Silver Company at Springdale, Conn., Manufacturers of German-Silver and Nickel Anodes. Illustrated description. 1700 w. Brass Wld—April, 1913. No. 41578.

Rolls

Seven-Roller Angle-Bar Straightening Machine. Illustrated description. 500 w. Engng—Jan. 3, 1913. No. 39159 A.

The Relation of Channel-Iron Roll Openings to the Axis of Grooves (Ueber die Lage von U-Eisenkalibern zur Walzlinie). E. Werlich. A study of the regulation of the flange heights. Discussion. Ills. 2000 w. Stahl u Eisen—Sept. 18, 1913. No. 46003 D.

Safety Appliances

Safeguarding Machinery at Hawthorne. Illustrates and describes how an electric company protects its shop employees from injury. 1200 w. Sci Am—April 12, 1913. No. 41178.

Safety Devices

Safeguards for Power Presses. Edward K. Hammond. Illustrates and describes safety devices adopted. 3000 w. Mach, N Y—Nov., 1912. No. 37161 C.

Safeguarding Motor-Driven Apparatus. D. C. Pultney. Illustrates and describes devices for safeguarding machinery driven by electric motors. 1800 w. Elec Jour—June, 1913. No. 43228.

See Accident Prevention and Grinding, under *Machine Works and Foundries*; also Accidents, under ELECTRICAL ENGINEERING, MISCELLANY.

Sawing Machines

Recent Developments in Metal Sawing Machines. Thomas R. Shaw. Illustrates and describes sawing machines of recent design. 1200 w. Cassier's Mag—Oct., 1912. No. 37157 B.

The Development of the Saw and Sawing Machinery (Die Entwicklung der Sägewerkzeuge und Sägemaschinen). Th. Wolff-Friedenau. A history covering ancient and modern forms of saws. Ills. 5000 w. Zeit f Werkzeug—Oct. 25, 1912. No. 37464 D.

Cold-Cutting Circular Sawing Ma-

chines for Heavy Duty (Kalt-kreissäge-maschinen mit hoher Arbeitsleistung). General description of various modern metal sawing machines. Ills. 1800 w. Zeit des Ver deutscher Ing—April 12, 1913. No. 42138 D.

See also Metal Cutting, under *Machine Works and Foundries*.

Saws

Automatic Bar Saw. Illustrated description of a new saw for metal bars, with automatic feed and cutting-off mechanism. 1200 w. Engr, Lond—Oct. 17, 1913. No. 46252 A.

Hack-Sawing Machines. Illustrates and describes two recent types. A sawing-machine for foundry runners, and a sawing-machine for boiler-plate flanges. 1000 w. Engng—Oct. 17, 1913. No. 46244 A.

Special Applications of Cold-Sawing Machines. Gustav Wagner System, for Rail Material (Sonderausführungen von Kaltsägemaschinen, System Gustav Wagner-Reutlingen, für Bahnmateriale). Eduard Müller. General description of several models and examples of their use on rail. Ills. 1000 w. Glaser's Ann—Aug. 15, 1913. No. 46011 D.

Saw-Sharpening

Automatic Saw-Sharpening Machine. Illustrated description of a machine for sharpening cold-saws. 700 w. Engng—July 25, 1913. No. 44184 A.

Screw Machines

The Grant Automatic Screw Machine. Illustrated detailed description of a four-spindle machine with novel features. 2000 w. Am Mach—Nov. 14, 1912. No. 37379.

The "Acme" Multiple Spindle Automatic Screw Machine. Douglas T. Hamilton. Illustrates and describes the design, construction, operation, tool equipment, etc. 3500 w. Mach, N Y—Dec., 1912. Serial. 1st part. No. 37978 C.

Special Knurling Operations. Douglas T. Hamilton. Illustrates and describes practice for the Brown & Sharpe automatic screw machines. 1200 w. Mach, N Y—Dec., 1912. No. 37980 C.

Automatic Screw-Machine Equipment. Douglas T. Hamilton. Illustrated description of the tool equipment used on the National-Acme multiple-spindle automatic screw machines. 3500 w. Mach, N Y—Feb., 1913. Serial. 1st part. No. 39607 C.

Setting Up and Operating Automatic Screw Machines. Douglas T. Hamilton. Illustrates and describes applications to the "Acme" multiple-spindle automatic screw machine. 4000 w. Mach, N Y—May, 1913. Serial. 1st part. No. 41787 C.

Selection

MACHINE WORKS AND FOUNDRIES

Shop Practice

Selection

Selecting the Correct Machine for the Work. Stuart Dean. Discusses the economical range of production for which each kind of machine should be adapted. 2000 w. Ir Age—Jan. 23, 1913. No. 39323 C.

Shapers

A Shaping Machine Efficiency Test. A. Lewis Jenkins. Describes interesting experiments to secure data on its mechanical efficiency. Ills. 2000 w. Ir Age—July 17, 1913. No. 43752 C.

Shears

Steam-Hydraulic Slab Shears. Illustrated description of powerful shears having new features. 2000 w. Engr, Lond—June 13, 1913. No. 43147 A.

Shop Appliances

Fixtures and Gages Used in Manufacturing the "Multigraph." Douglas T. Hamilton. Illustrates and describes devices used in the lathe, shaper, and milling machine. 2000 w. Mach, N Y—April, 1913. No. 40982 C.

Shop Costs

Shop Costs. W. C. Connelly. Read before the Am. Boiler Mfrs. Assn. Considers the subject as applied to boilers and like work. 1800 w. Boiler Maker—Sept., 1913. No. 45216.

Cost Estimating in Machine Construction. A. C. Jewett. A discussion of factors affecting cost and methods of estimating cost of manufacture. 1400 w. Mach, N Y—Sept., 1913. No. 44839 C.

Shop Efficiency

Possible Economies in Shop Transportation. Robert Thurston Kent. Explains devices which have resulted in reducing time between machine operations. 2500 w. Ir Age—Aug. 7, 1913. No. 44199 C.

Shop Hygiene

The Human Element in Industry. Winthrop Talbot. Explains the economies of proper attention to shop hygiene. 4500 w. Ir Age—Feb. 6, 1913. Serial, 1st part. No. 39667 C.

Shop Lighting

Illumination of Engineering Workshops by Gas, Electricity, and Oil. Franklin Thorp. Abstract of paper read before the Manchester Assn. of Engrs. Discusses illuminants in reference to cost, maintenance, reliability, etc. Ills. 2000 w. Mech Engr—Feb. 7, 1913. Serial, 1st part. No. 39912 A.

Machine Shop Lighting in Steel Mills. C. E. Clewell. Analysis, showing right and wrong methods. Ills. 4500 w. Am Mach. Feb. 20, 1913. No. 39900.

Industrial Lighting. Discusses means of making the best possible use of day-

light illumination. Ills. 2000 w. Sci Am Sup—Aug. 23, 1913. No. 44502.

Shop Practice

Piston, Piston Rod and Crosshead Repairs. George Black. Showing what can be done in the smaller shops without special tools or facilities for the work. Ills. 2000 w. Am Engr—Nov., 1912. No. 37303 C.

Fluting Angular Milling Cutters and Tapered Reamers. George W. Burley. Data sheet, tables and illustrated description. 2500 w. Mach, N Y—Nov., 1912. No. 37165 C.

American Shop Practice of the Fiat. Ethan Viall. Illustrates and describes features of the grinding, turret lathe, and milling work. 1200 w. Am Mach—Nov. 28, 1912. No. 37833.

The Manufacture of Revolver Frames. Ethan Viall. Illustrates and describes special milling fixtures and machines. 1200 w. Am Mach—Nov. 7, 1912. No. 37296.

Methods of a Marine Engine Builder. Robert Mawson. Illustrates and describes tools and methods used in a Jersey City shop. 1200 w. Am Mach—Dec. 26, 1912. No. 38541.

Building Gasoline Engines in Canada. D. O. Barrett. Illustrates and describes tool equipment and methods used. 1500 w. Am Mach—Dec. 5, 1912. No. 38058.

Motorcycle Work at the Pierce Shop. Ethan Viall. Illustrates and describes machines and fixtures used. 1500 w. Am Mach—Dec. 5, 1912. No. 38059.

Saving Space in a Steel Warehouse. Illustrates and describes a system of steel racks for the handling of bars and sheets. 800 w. Ir Age—Dec. 19, 1912. No. 38274 C.

Methods in a Colorado Pattern Shop. F. A. Stanley. Illustrates and describes practice at the Vulcan Works. 1600 w. Am Mach—Dec. 5, 1912. No. 38057.

Making Mine Car Housings and Wheels. F. A. Stanley. Illustrates and describes tools and operations used in a Colorado shop. 1500 w. Am Mach—Dec. 26, 1912. No. 38542.

Sheet Steel Work in a Salt Lake Shop. F. A. Stanley. Illustrates and describes operations in shearing, punching and bending triangular plates, preparatory to riveting in a conical form for settling tanks. 2000 w. Am Mach—Jan. 23, 1913. No. 39286.

Methods and Tools in Montana Shops. F. A. Stanley. Illustrates and describes interesting operations and tools in three shops where mining equipment and other

Shop Practice

MACHINE WORKS AND FOUNDRIES

Shop Practice

machinery is built and repaired. 2500 w. Am Mach—Feb. 6, 1913. No. 39673.

Methods of the Autopress Shops. Gives examples of methods employed in shops where a high-speed automatic printing press is manufactured. Ills. 1000 w. Am Mach—Dec. 19, 1912. No. 38268.

Closing Bushes. J. Stormonth. Drawing and detailed description of such work. 2200 w. Mech. Wld—Nov. 22, 1912. No. 38026 A.

The Manufacture of Brake Beam Hangers. R. S. Mounce. Illustrates and describes methods used at the Cleveland shops of the Erie, by which the labor cost is only five cents each. 1000 w. Am Engr—Dec., 1912. No. 38202 C.

Making Rolls for Paper Machinery. Fred H. Colvin. Illustrated description of a modern plant in which a variety of roll turning and grinding operations is performed. 1500 w. Am Mach—Dec. 19, 1912. No. 38270.

Workmen's Skill vs. Modern Machinery. Fred H. Colvin. Illustrates and describes methods of making edge tools, practically by hand labor. 3500 w. Am Mach—Jan. 30, 1913. No. 39542.

Drilling and Milling in a Pioneer Auto Shop. Fred H. Colvin. Explains how machining methods have been developed to secure low-cost production. Ills. 1200 w. Am Mach—Jan. 23, 1913. No. 39283.

Developments in Machine Shop Practice. Report of the sub-committee on machine shop practice submitted at Dec. meeting of the A. S. M. E. A review of the most important improvements during the last ten years. 7000 w. Mach, N Y—Jan., 1913. No. 38722 C.

Machine Shop Practice of General Interest. Alexander Taylor. Illustrates and describes a few of the practices in vogue in plants of the Westinghouse Electric & Mfg. Co., 4500 w. Am Mach—Jan. 30, 1913. No. 39545.

Machining Gasoline Engine Parts. F. B. Jacobs. Illustrates and describes methods employed in making the Keystone gasoline engine. 700 w. Mach, N Y—Jan., 1913. No. 38721 C.

Methods of an Electrical Vehicle Shop. Robert Mawson. Illustrates and describes special tools and operations. 1000 w. Am Mach—Jan. 9, 1913. No. 38944.

Measuring Accuracy. Illustrates and describes methods of ensuring accuracy in the workmanship of the Napier cars. 1000 w. Auto Jour—Jan. 18, 1913. No. 39456 A.

Shop and Machine Details from the White Shop. Illustrated description of details of this shop in Cleveland, O., and

of tools and methods. 1500 w. Am Mach—Jan. 16, 1913. No. 39124.

Practice of Union Switch & Signal Co. Illustrates and describes some special machines and methods. 1800 w. Am Mach—Jan. 30, 1913. No. 39543.

Developments in Machine Shop Practice During the Last Decade. Report of sub-committee on the principal improvements developed. 7000 w. Jour Am Soc of Mech Engrs—Feb., 1913. No. 40149 D.

Little Economies for the Machine Shop. Stuart Dean. Shop Suggestions. 1500 w. Ir Age. Feb. 6, 1913. No. 39668 C.

Making Small Parts on Screw Machines. Illustrates and describes interesting attachments employed in manufacturing the comptometer. 1800 w. Ir Age—Feb. 6, 1913. No. 39666 C.

Methods of Making a High Grade Car. Robert Mawson. Illustrates and describes some interesting drill jigs, well made index jigs and machine broachers, fixtures, etc. 2000 w. Am Mach—Feb. 6, 1913. No. 39670.

Methods Used in Making Pneumatic Tools. Fred H. Colvin. Illustrates and describes tools and work. 2500 w. Am Mach—Feb. 27, 1913. No. 40140.

More Interesting White Shop Methods. Fred H. Colvin. Illustrates and describes drilling fixtures and machines for cylinder and crankshaft work. 1700 w. Am Mach—Feb. 13, 1913. No. 39842.

Wafer Safety Razor Blade Processes. Ethan Viall. Illustrates and describes manufacturing operations. 1700 w. Am Mach—Feb. 13, 1913. No. 39841.

Producing High-Speed Drilling Machines. Ethan Viall. Some of the methods used for machining the principal parts are illustrated and described. 1500 w. Am Mach—March 13, 1913. No. 40421.

Bettering the Efficiency of the Structural Shop. Edwin J. Knapp. Discusses the drawing-room, layout, fitting and crane service. 4000 w. Engineering Magazine—April, 1913. No. 40913 B.

Lathe Manufacturing in the Northwest. F. A. Stanley. Illustrates and describes methods and tools employed in a shop at Seattle, Wash. 1500 w. Am Mach—March 6, 1913. No. 40326.

Shop Practice of the Willys-Overland Co. Douglas T. Hamilton. Illustrates and describes the machinery of a four-throw crankshaft, and other parts. 3000 w. Mach, N Y—March, 1913. No. 40267 C.

Automobile Manufacturing Methods. Douglas T. Hamilton. Illustrates and describes interesting milling jigs and fixtures used in producing the Reo mo-

Shop Practice

MACHINE WORKS AND FOUNDRIES

Shops

tor car. 3500 w. Mach, N. Y.—July, 1913. No. 43364 C.

Tap Fluting Cutters. Illustrates and describes methods and cutters used. 1500 w. Mach, N. Y.—March, 1913. No. 40270 C.

Making the Red-E Tool Holder. Chester L. Lucas. Illustrated description of specialized manufacture in which broaching plays an important part. 1700 w. Mach, N. Y.—May, 1913. No. 41793 C.

Milling Operations on the Vellie 40 H. P. Cylinders and Crank Case. C. T. Shaefer. Illustrates and describes the fixtures and methods used. 1200 w. Horseless Age—June 25, 1913. No. 43191.

Making Ball Players' Shoe Plates. A. F. Horton. Illustrates and describes tools used for blanking, swaging, piercing, forming and grinding. 1500 w. Mach, N. Y.—June, 1913. No. 42573 C.

Making Steel Type. Chester L. Lucas. Illustrates and describes methods used in the manufacture. 2500 w. Sci Am Sup—June 14, 1913. No. 42821.

Machining and Assembling Automobile Engines. Harry C. Spillman. Illustrated description of methods used in a Detroit plant. 2500 w. Ir Age—July 24, 1913. No. 43848 C.

Making a Sheet-Steel Miter-Box in the Punch Press. Describes some interesting punches and dies used in producing miter-boxes from sixteen-gage sheet-steel. Ills. 2000 w. Mach, N. Y.—July, 1913. No. 43360 C.

Some Machine and Fitting Shop Wrinkles. F. R. Parsons. The present article explains how to bend tubes without distortion, cutting gauge glasses, drawing the temper of a file, annealing tool steel, &c. 800 w. Mech Wld—Aug. 8, 1913. Serial, 1st part. No. 44455 A.

Some Slotting Machines and Tools Used in the Pond Shops. Alfred Spangenburg. Describes methods of equipping and tooling slotters for greater efficiency. Ills. 1200 w. Mach, N. Y.—Aug., 1913. No. 44082 C.

Machining Automatic Chucking Machine and Lathe Turrets. C. M. Conradson. Illustrates and describes special boring and planer fixtures. 900 w. Mach, N. Y.—Sept., 1913. No. 44837 C.

Method of Machining an Automobile Worm-Housing. Albert A. Dowd. Illustrates and describes the tool equipment and machining operations. 1500 w. Horseless Age—Sept. 24, 1913. No. 45436.

Methods Used in Manufacturing the Jones Speedometer. Edward K. Hammond. Describes making the parts,

assembling and testing the finished instruments. Ills. 3000 w. Mach, N. Y.—Sept., 1913. No. 44846 C.

See also same heading, under RAILWAY ENGINEERING, Motive Power and Equipment.

Shops

A Cleveland Sheet Metal Working Plant. Illustrates and describes the equipment and shop arrangement of a modern factory. 1200 w. Ir Age—Nov. 14, 1912. No. 37751 C.

Massillon Bridge & Structural Company's Shop. Illustrates and describes details of shop arrangement and oil burning forge equipment. 1000 w. Ir Age—Nov. 21, 1912. No. 37723 C.

Park Works, Manchester. Illustrated description of new works at Newton Heath for manufacturing pumps, valves, humidifiers, cast iron tanks, fire extinguishing appliances, etc. 2000 w. Engr, Lond—Nov. 1, 1912. No. 37551 A.

A Large Machine Plant in Colorado. F. A. Stanley. Illustrates and describes features of a Denver shop. 1600 w. Am Mach—Nov. 28, 1912. No. 37832.

A Colorado Farm Implement Plant. F. A. Stanley. Special tools used in a Denver, Colo. shop are illustrated and described. 2000 w. Am Mach—Nov. 21, 1912. No. 37661.

A Sheet Metal and Stamping Plant. Illustrates and describes the equipment and shop arrangement. 1500 w. Met Work—Nov. 8, 1912. No. 37327.

Improving the Efficiency of a Check-Room. R. H. Wadsworth. An illustrated account showing conditions that formerly existed and the increase in efficiency in the check-room system. 1500 w. Mach, N. Y.—Dec., 1912. No. 37979 C.

Lessons of Gilbert & Barker Shops. John Nelson. Illustrated description of works at Springfield, Mass. Acetylene generator house designed to minimize explosion damage. 2500 w. Ir Age—Jan. 2, 1913. No. 38752 C.

A Modern Plant for Automobile Parts. Illustrated description of Detroit works designed and equipped for quantity manufacture. 4500 w. Ir Age—Jan. 2, 1913. No. 38750 C.

Equipment of Union Switch & Signal Co. Illustrates and describes features of the equipment of the foundry, forge shop, and power house. 1600 w. Am Mach—Feb. 6, 1913. No. 39672.

A Large Machine Shop in Spokane. F. A. Stanley. Illustrates and describes special tools used in building machinery for mining, logging, irrigating, etc. 1500 w. Am Mach—Feb. 20, 1913. No. 39898.

A Large Montana Mining Machine

Shops

MACHINE WORKS AND FOUNDRIES

Shops

Shop. F. A. Stanley. Illustrates and describes a shop for building and repairing mining apparatus with the aid of special machines and fixtures. 2500 w. Am Mach—Feb. 13, 1913. No. 39839.

A Modern Sheet Metal Working Shop. Illustrated description of a shop in Cambridge, Mass., designed to provide ample light and space for workmen. 2500 w. Met Work—March 14, 1913. No. 40471.

Plant for Making Automobile Tool Boxes. Illustrated description of a Cleveland, O., sheet metal working shop for making automobile accessories. 2000 w. Ir Age—March 13, 1913. No. 40631 C.

Layout and Building Details of a Machine Shop. Plan, drawings, and description of a new plant at Bridgeport, Conn. 1500 w. Eng Rec—March 29, 1913. No. 40957.

Plant of the Duff Mfg. Company, Pittsburgh. Illustrated description of an interesting factory in its construction features and arrangements. 2500 w. Ir Age—April 10, 1913. No. 41152 C.

A Saxon Engineering Works. Charles R. King. Illustrated description of the methods, equipment and products. First of two articles. 3500 w. Engineering Magazine—May, 1913. No. 42487 B.

A Saxon Engineering Works. Charles R. King. Illustrated description of the characteristic shop methods, machine tools and processes. 2000 w. Engineering Magazine—July, 1913. No. 43098 B.

Plant of Henry Vogt Machine Company. G. D. Crain, Jr. Illustrates and describes the modern equipment of the works at Louisville, Ky. 2200 w. Ir Age—May 22, 1913. No. 42305 C.

A Visit to a Lincoln Engineering Works. Illustrated detailed description of the works and equipment, with an outline of their history. 4500 w. Engr, Lond—May 23, 1913. No. 42757 A.

St. Lawrence Bridge Company's New Shop. Describes the arrangement and equipment of a \$1,000,000 plant constructed at Montreal, especially for fabrication of the Quebec bridge superstructure. Ills. 2500 w. Eng Rec—June 7, 1913. No. 42711.

Lang's Lathe Works at Johnstone. Illustrated description of the shops, and of some features of the product. 2500 w. Engng—June 6, 1913. No. 42883 A.

The Packard Motor Car Company, Detroit. Oliver J. Abell. Illustrated general description of the purposes, plant methods, and organization for the building of motor cars and trucks. 2500 w. Ir Age—June 5, 1913. Serial. 1st part. No. 42658 C.

The Layout, Design and Equipment of Industrial Works. A. Home Morton.

Condensed from paper read before the Liverpool Engng Soc. Discusses general considerations, arrangement, power, design and construction, etc. 4500 w. Ind Engng—July, 1913. No. 43460 C.

Modernizing an Old Manufacturing Plant. Illustrations and detailed description of changes made in a plant at Windsor Locks, Conn. 1500 w. Ir Age—July 17, 1913. No. 43753 C.

A Modern Plant for Building Pumps. Charles A. Hirschberg. The new shop of the Cameron Steam Pump Works, at Phillipsburg, N. J., is described, as well as the product. Ills. 2500 w. Compressed Air—July, 1913. No. 43993.

Manufacture of Switches and Frogs. Illustrated description of the Cincinnati plant of the Weir Frog Co. 2500 w. Ry & Engng Rev—June 28, 1913. No. 43358.

The Works of Messrs. Thomas Shanks & Co., of Johnstone. Illustrated account of the range of work covered by this firm, describing some of the latest machines. 2500 w. Engng—June 20, 1913. No. 43387 A.

A Complete Elevator Manufacturing Plant. Illustrated description of a recently completed plant in Honesdale, Pa. A combination of the standard monitor roof with saw tooth construction, with steel sash. 2000 w. Ir Age—July 10, 1913. No. 43493 C.

Queen's Engineering Works, Bedford. Illustrated description of the general layout and details of the shops. Plate. 3000 w. Engr, Lond—July 4, 1913. No. 43722 A.

The New Works of Messrs. Nasmyth, Wilson & Co., Ltd., Patricroft, Manchester. Brief review of the history of this firm, with detailed description of the works. 6000 w. Ry Gaz, Lond—June 27, 1913. No. 43634.

The Works of Messrs. Ransomes & Rapier, Ltd. Illustrated detailed description of the Waterside Iron Works, Ipswich, with an outline of their history. 4000 w. Engng—July 18, 1913. No. 43963 A.

The Works of Messrs. Reavell & Co., Ltd. Illustrated detailed description of the Ranelagh Works, Ipswich, and methods. Plates. 7500 w. Engng—June 27, 1913. No. 43640 A.

Engineering Works at Broadheath. Illustrates and describes new workshops of George Richards & Co., Ltd. 1700 w. Engr, Lond—Aug. 1, 1913. No. 44322 A.

The Youngstown Sheet and Tube Company. Illustrated description of the open-hearth plant, blooming mill and other details of the recent important ex-

Slotting

MACHINE WORKS AND FOUNDRIES

Tools

tensions. 3000 w. Ir Age—Aug. 14, 1913. No. 44341 C.

The Works of Messrs. W. H. Allen, Son and Co., Limited. Brief review of the history and principal manufactures, with illustrated description of the present works. 5000 w. Engng—July 25, 1913. No. 44181 A.

The Fried. Krupp Works, Friedrich-Alfred Hütte, Rheinhausen. Illustrated description of the most completely equipped works of their kind in Germany. Plates. 2000 w. Engng—Sept. 5, 1913. Serial, 1st part. No. 45153 A.

Increasing the Output While Rebuilding a Shop. Illustrated description of the reconstruction of the Canadian Locomotive Co.'s works, especially the equipment and arrangement of the foundry. 2500 w. Foundry—Sept., 1913. No. 44859.

A Combined Office and Workshop. F. Southey. Describes an addition to the works of Siemens Bros. & Co. at Woolwich, consisting of a 5-story building and a 1-story workshop. Ills. 2000 w. Engr, Lond—Aug. 29, 1913. No. 45043 A.

The Trumbull Sheet and Tin Plate Mills. Illustrates and describes the equipment of new works at Warren, Ohio. 2500 w. Ir Age—Sept. 11, 1913. No. 45052 C.

See also Factory Buildings, under Civil Engineering, *Construction*; and Shops, under Railway Engineering, *Motive Power and Equipment*.

Slotting

A Semi-Automatic Slotting Fixture. J. H. Harris. Illustrated description of a fixture used by the Remington Typewriter Co. 500 w. Mach, N Y—Nov., 1912. No. 37167 C.

Special Machines

Specialized Machine Tool Equipment. Douglas T. Hamilton. Illustrates and describes special machines used in the manufacture of drilling machines. 1500 w. Mach, N Y—Aug., 1913. No. 44077 C.

Special Tools

Special Tools of an Elevator Company. Robert Mawson. Illustrates and describes a number of special attachments. 1500 w. Am Mach—Nov. 28, 1912. No. 37836.

Graduating Machine and Other Tools. F. A. Stanley. Illustrates and describes special equipment used in the manufacture of drilling machines. 3000 w. Am Mach—Nov. 14, 1912. No. 37832.

Tanks

Manufacturing Cold Drawn Steel Shells. Illustrates and describes the new plant of the Prest-O-Lite Company in Indianapolis, making tanks for distribut-

ing acetylene gas for lighting and welding purposes. 2500 w. Ir Age—Sept. 4, 1913. No. 44953 C.

Tempering

Experiments on Tempering (Sur les essais de trempe). G. Charpy. Criticisms on paper presented by M. Osmond to the Commission française des Méthodes d'essai des matériaux de construction. 3000 w. Rev de Metall—March, 1913. No. 40590 H.

Thermometers

The Manufacture of Thermometers. Illustrates and describes processes employed in making engineers' industrial and clinical thermometers. 2500 w. Ind Engng—March, 1913. No. 40719 C.

Threading

Knock-off Arbors for Threaded Work. Albert A. Dowd. Illustrates and describes arbors adapted for various operations. 2800 w. Mach, N Y—Aug., 1913. No. 44078 C.

Tools

Home Made Tools in a Colorado Shop. F. A. Stanley. Illustrates and describes an indexing appliance, an inverted punching machine, shears and punches and a special crane. 1500 w. Am Mach—Dec. 19, 1912. No. 38261.

Special Tools Used on Marine Engines. Robert Mawson. Illustrates and describes interesting tools and operations in a Jersey City shop. 1200 w. Am Mach—Dec. 19, 1912. No. 38264.

Special Tools in a Pennsylvania Shop. Robert Mawson. Illustrates and describes some interesting drilling-machine heads and drill jigs, a novel die-sinking attachment, etc. 1000 w. Am Mach—Jan. 2, 1913. No. 38733.

Tools for a High Grade Automobile. Robert Mawson. Illustrated description of accurately made tools and methods employed. 2000 w. Am Mach—Jan. 23, 1913. No. 39281.

Locomotive Boiler Tube Tools. Walter R. Hedeman. Illustrates and describes tools giving efficient service in one of the largest repair shops in the United States. 2000 w. Am Engr—Jan., 1913. No. 38965 C.

Some Tools Used by the Gramm Motor Car Co. P. Steiner. Illustrates and describes jigs, fixtures and testing devices used in auto truck manufacture. 2500 w. Mach, N Y—Jan., 1913. No. 38725 C.

Tools for Boiler Makers and Their Uses. W. D. Forbes. The present number considers single piece tools. Ills. 1500 w. Boiler Maker—Feb., 1913. Serial, 1st part. No. 39829.

Tools for Multiple Plunger Presses. Charles Doescher. Describes the con-

Tools

MACHINE WORKS AND FOUNDRIES

Welding

struction and use of the punches and dies as applied to this type of press. Ills. 2500 w. Mach, N Y—Feb., 1913. No. 39606 C.

Improved Tool for Turning and Screw Threading. Illustrates and describes an invention of H. S. Land, and its operation. 1800 w. Prac Engr—Feb. 20, 1913. No. 40310 A.

Punch and Die Made in Sections. A. L. Monrad. Illustrated account of the making of a punch and die for producing the type bar plates for linotype machines. 1500 w. Mach, N Y—March, 1913. No. 40268 C.

Manufacturing Broaching Machines and Tools. Illustrated description of the Lapointe system. 1400 w. Ir Trd Rev—March 27, 1913. No. 40885.

Special Tools for Printing Presses. Robert Mawson. Illustrations, with brief descriptions. 1100 w. Am Mach—March 13, 1913. No. 40422.

Special Tools for Electric Trucks. Robert Mawson. Describes a cam equalizing device and some indexing applied to drill jigs, etc. Ills. 1200 w. Am Mach—Feb. 20, 1913. No. 39899.

Some Tools in an Idaho Machine Shop. F. A. Stanley. Illustrates and describes machines and tools built for various uses. 1500 w. Am Mach—Jan. 2, 1913. No. 38735.

Tools and Methods in Logging Engine Work. F. A. Stanley. Illustrates and describes special devices and methods used in a Seattle, Wash., shop. 700 w. Am Mach—March 13, 1913. No. 40419.

Making Foundry Tools by Short-Cut Methods. Joseph Horner. Illustrates and describes simple methods of molding and casting iron flasks, with data on pattern-making. 2500 w. Foundry—April, 1913. No. 41035.

Hints on Jig and Tool Design. The present number considers the duties of a jig and tool specialist. Ills. 1200 w. Mech Wld—April 25, 1913. Serial. 1st part. No. 41923 A.

Small Tools—The Basis of Economic Manufacturing. W. J. Kaup. Fifth of a series of articles on works management. Discusses the subject of tool estimates, the cost of small tools, their design, the materials used, and related subjects. 2500 w. Elec Jour—Sept., 1913. No. 45103.

Economy in Tool Design. E. H. Pratt. Gives two extreme cases—one in which the cost was increased and the other decreased. Ills. 1200 w. Mach, N Y—Sept., 1913. No. 44845 C.

Correct Cutting Angles for High-Speed Steel Tools. Gives charts for the Gisholt tool grinder, explaining their use. 1200

w. Mech Wld—Oct. 17, 1913. Serial, 1st part. No. 46234 A.

See also Machine Tools, and Pneumatic Tools, under *Machine Works and Foundries*; and Tool Steel, under *Mining and Metallurgy, Iron and Steel*.

Type Machine

The Vetter Steel Type Making Machine. Chester L. Lucas. Illustrated description of a recent development in machinery for making steel type for typewriters. 1500 w. Mach, N Y—Aug., 1913. No. 44083 C.

Type Making

Making Steel Type. Chester L. Lucas. Information concerning methods of cutting letters in steel by hand and machine. Ills. 2500 w. Mach, N Y—April 1913. No. 40980 C.

Undulator

The Undulator. A. S. Rogers. Illustrates and describes a modified reciprocator for ornamental lathes. 2500 w. Sci Am Sup—July 5, 1913. No. 43430.

Welding

Electric Welding. L. J. Hibbard. Discusses methods and their applications, describing welding machines and illustrating examples of work. General discussion. 6000 w. Pro Ry Club of Pittsburgh—Sept. 27, 1912. No. 37909 C.

More Notes on Electric Welding. V. D. Green. Read before the Birmingham & Dist. Elec. Club. Refers to a paper read three years ago and considers arc and butt welders in detail and recent developments. Ills. 3500 w. Elec Rev, Lond—Nov. 15, 1912. Serial. 1st part. No. 37804 A.

Autogenous Welding of Aluminium-Copper and Its Alloys. Dr. F. Carnevali. Abstract of paper read before the Inst. of Metals. Report of experimental researches on oxy-acetylene autogenous welding of metals other than iron. Ills. 2500 w. Mech Engr—Oct. 25, 1912. Serial. 1st part. No. 37291 A.

Oxy-Acetylene Welding for Ordinary Operation. James Steelman. Illustrates and describes practical uses of the welding torch. 1400 w. Cassier's Mag—Oct., 1912. No. 37156 B.

Arc Welding. J. F. Lincoln. Reviews the history of the welding of metals by the use of the electric arc, describes types of arc welders, etc. 2800 w. Am Found Assn—Del., 1912. No. 38615 N.

Welding and Cutting With Oxy-Acetylene Gas. M. S. Plumley. From a paper read before the Ir. and St. Elec. Engrs. An account of the wide application of the process, with some comparative costs. 4500 w. Ir Trd Rev—Dec. 5, 1912. No. 38054.

Welding

MACHINE WORKS AND FOUNDRIES

Welding

Welding by Machinery. James Steelman. Illustrates applications of the acetylene-oxygen torch. 5000 w. *Casier's Mag*—Nov., 1912. No. 38365 B.

Welding of High Pressure Pipe Lines. Leon B. Jones. Read before the Pacific Coast Gas Assn. Illustrates and describes methods and gives information concerning the work. 3500 w. *Dom Engng*—Dec. 7, 1912. No. 38082.

Electric Resistance Welding. P. Bucher. Read before the Manchester Sec. of the Inst. of Elec. Engrs. Explains the advantages discussing the current supply, method of operation, applications, reliability, etc. 3000 w. *Ir & Coal Trds Rev*—Jan. 3, 1913. No. 39176 A.

Electric Arc Welding on the Pacific Coast. Illustrated account of the experience of two electric railways in rehabilitating worn track and equipment by building up with new metal welded into place by the electric arc. 1800 w. *Elec Ry Jour*—Jan. 11, 1913. No. 39111.

Some Notes on Welding. A. C. Gough. Discusses the condition of the fire, fluxes, principles of welding and forging, the welding heat, etc. Ills. 2000 w. *Mech Wld*—Jan. 3, 1913. No. 39151 A.

The Essentiality of Autogenous Welding of Different Kinds of Steel and Iron, and Its Practical Application. Max Bermann. Read before the Int. Assn. for Test. Mat. Considers conditions essential to perfect welding. 1500 w. *Chem Engr*—Jan., 1913. No. 39501 C.

Electric Welding Applied to Boiler Work. Illustrates and describes repair jobs made in the shops at Elizabethport, N. J. 2000 w. *Boiler Maker*—Feb., 1913. No. 39828.

Oxy-Acetylene Welding and Cutting. Henry W. Jacobs. Observations on the development of this art in European commercial and railway repair establishments. Ills. 1500 w. *Ry Age Gaz*—March 14, 1913. No. 40658.

Electric Resistance Welding. P. Bucher. Abstract of a paper and discussion at Manchester, Eng. Briefly considers the methods of electric welding and the applications. 2800 w. *Elec'n, Lond*—Feb. 21, 1913. No. 40304 A.

Autogenous Welding. Discussion at Atlanta, Ga., Jan. 20, 1913. 8500 w. *Pro S & S-W Ry Club*—Jan., 1913. No. 42258 C.

Electric-Arc Welding and Other Features of the San Francisco Shops. Gives particulars of different kinds of repair work. Ills. 2000 w. *Elec Ry Jour*—May 17, 1913. No. 42231.

Best Methods of Welding Superheating Tubes, and Tools Used for Same. Ab-

stract of a committee report before the Master Boiler Makers' Assn. Ills. 1500 w. *Boiler Maker*—June, 1913. No. 42969.

Electric Welding and Motor Rejuvenation. Illustrates and describes methods used by the Third Ave. railroad of New York, on many forms of electric welding and also rejuvenating two types of motors. 1200 w. *Elec Ry Jour*—June 21, 1913. No. 43116.

Investigations on Electric Resistance Welding by the Point Process (Untersuchungen über elektrische Widerstandsschweißung nach dem Punktverfahren). Otto Fuchs. A study of the process and some microstructures of welds so made. Ills. 6000 w. *Elek u Masch*—June 8, 1913. No. 43046 D.

The Use of Autogenous Welding in the Railway Repair Shop (Anwendung der autogenen Schweißung in Eisenbahn-Reparaturwerkstätten). Th. Kautny. A brief review of the oxyacetylene process, and work to which it is adapted. Ills. Serial. 1st part. 3500 w. *Gläser's Ann*—May 15, 1913. No. 43017 D.

The Adaptability of Electric Welding. George Hills. Brief article giving methods and data. Ills. 1200 w. *Met & Chem Engng*—July, 1913. No. 43489 C.

A New Arc Welding Machine. Illustrated description of the application of the multiple unit principle to this work. 1500 w. *Ir Age*—July 17, 1913. No. 43754 C.

Welding Boiler-furnace Flues. J. Leslie. Calls attention to points of importance in successful work. Ills. 3000 w. *Mech Wld*—June 20, 1913. No. 43383 A.

Thermite for Naval Use. Louis E. Browne. Illustrates applications of thermite welding and explains its great usefulness. 600 w. *Sci Am Sup*—Aug. 23, 1913. No. 44501.

Electric and Autogenous Welding and Cutting in Foundry and Other Operations (Elektrisches und autogenes Schweißen und Schneiden in Giessereien und anderen Betrieben). O. Cramer. A review of some welding operations made possible by these means. Ills. Serial, 1st part. 2400 w. *Giess-Zeit*—July 1, 1913. No. 44624 D.

Thermit Welding. Alfred J. Higgin. Discusses the subject particularly in reference to joining tramway rails for electrical purposes. Ills. 2000 w. *Aust Min Stand*—Sept. 11, 1913. Serial, 1st part. No. 45835 B.

Use of the Oxy-Acetylene Torch in Foundries. H. Cole Estep. Explains how risers, shrink-heads, etc., are removed economically by this process, giving data

Wire

on welding cast iron and steel. Ills. 4000 w. Foundry—Oct., 1913. Special. No. 45710 C.

See also Boilers, under *Steam Engineering*.

Wire

The Manufacture of Wire and Cable. H. O. Blatt. Illustrated description of the successive manufacturing stages, and the machine used. 5800 w. Can Elec News—Feb. 1, 1913. No. 39569.

Wire Drawing

Designing Wire Forming Machines. G. E. Thompson. Gives the design of an automatic forming machine for the production of a simple object from a coil of wire. Ills. 1500 w. Am Mach—Dec. 19, 1912. No. 38267.

Notes on Early Wire-Drawing Practice. Percy Longmuir and Joseph Kenworthy. Illustrated review of the history of wire-drawing. 3500 w. Engng—April 18, 1913. No. 41770 A.

See also Wire Mills, under **MINING AND METALLURGY, Iron and Steel**.

Woodworking

Millwrighting and Machine Woodworking. Alexander T. Deinzer. Remarks on the expense of misworked machinery, the abuse of shafting, &c. 2500 w. Wood Craft—Aug., 1913. No. 44194.

MATERIALS OF CONSTRUCTION**Alloys**

Wrinkles in Woodstaining for Cabinet-makers. A. H. H. Haines. Discusses mahogany and walnut and their special features for the finisher, ebony and other blocks on woods, fuming, &c. 2500 w. Wood Craft—Aug., 1913. No. 44197.

A Special Dovetailing Job in Machine Woodworking. James F. Hobart. Illustrated detailed description of the work. 2500 w. Wood Craft—Aug., 1913. No. 44196.

Wood Working Shops (Holzbearbeitungswerkstätten). W. Vorwerck. Plans for arrangement, equipment and costs of shops. Ills. Serial, 1st part. 1800 w. Zeit für Werkzeug—July 5, 1913. No. 44671 D.

Workshops

The Engineering Workshops of the University of Sheffield. George W. Burley. Illustrates and describes the mechanical equipment and methods of instruction. 2000 w. Mach, N Y—May, 1913. No. 41791 C.

Work Supports

Intermediate Work Supports. George W. Burley. Illustrates and describes methods used—the steady rests, machine jacks, etc. 1400 w. Mech Wld—Jan. 31, 1913. Serial, 1st part. No. 39789 A.

MATERIALS OF CONSTRUCTION**Abrasives**

Carborundum and Aloxite. Describes these two abrasives and their manufacture. Both are products of the electric furnace. 2000 w. Ry Mas Mech—May, 1913. No. 42204 C.

Alloys

Chemical Methods for Studying Alloys (Sur la Méthode Chimique pour l'Étude des Alliages). M. A. Portevin. Reviews the utility of such methods, with examples. Ills. 1800 w. Rev de Metall—Nov., 1912. No. 37503 H.

Alloys of Platinum and Aluminum (Sur les Alliages du Platine avec l'Aluminium). M. Chouriguine. An account of the experimental work done by the author, his apparatus, and a metallographic study of the results. Ills. 2500 w. Rev de Metall—Nov., 1912. No. 37502 H.

Duralumin (Duralumin). Leo M. Cohn. Presents some of the properties of this alloy which contains over 90 per cent pure aluminum, and which is stronger and harder than the base metal, also its uses in electrical and mechanical constructions. Diagrams. Serial. 1st part. 4800 w. Elek u Masch—Sept. 29, 1912. No. 37471 D.

Notes on the Metallography of Alloys. William Campbell. Notes on the three groups of white metals and a comparison with the structure of the bronzes. Ills. 8000 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38368 F.

Copper Alloys for Motor Car Service. William H. Barr. Information concerning the basic ingredients, copper, tin, zinc and lead, and the high copper alloys used in motor car construction. 3000 w. S A E Bul—Nov., 1912. No. 38568 N.

Copper Alloys for Motor Car Service. W. H. Barr. Read before the Detroit Soc. of Auto Engrs. Information concerning copper, tin, zinc and lead and their combinations. 3500 w. Foundry—Dec., 1912. No. 37991.

Alloys of Cobalt With Chromium and Other Metals. Elwood Haynes. Describes researches with this alloy. 1500 w. Brass Wld—Jan., 1913. No. 39346.

Wittorff's Iron-Carbon Equilibrium Diagram. Bradley Stoughton. Abstract translation from the Russian of a study of iron-carbon alloys. Ills. 2500 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40157 F.

Consult Classification of the Index. See page 9.

Alloys

MATERIALS OF CONSTRUCTION

Aluminum

Some Alloys Suitable for Instrument Work. W. Rosenhain. Read before the Optical Convention. Calls attention to certain alloys, not ordinarily employed, which appear to possess properties which render the most special value for instrument making. 2500 w. *Sci Am Sup*—Feb. 8, 1913. Serial, 1st part. No. 39723.

Alloys of Cobalt with Chromium and Other Metals. Elwood Haynes. A report of research work. Short discussion. 2200 w. *Bul Am Inst of Min Engrs*—Feb., 1913. No. 40159 F.

Some Experiments on the Effect of Sulphur on Copper. Erwin S. Sperry. Gives experiments which show the irregularities due to the presence of sulphur. 2000 w. *Brass Wld*—March, 1913. No. 40695.

The Structure of Acicular Alloys (Sur les constituants en aiguilles des alliages). Felix Robin. A study of the needle formations in aluminum bronzes and special tin alloys. Ills. 1200 w. *Bul Soc d'Enceur*—Jan., 1913. No. 40586 E + F.

I. Determination of the Position of Ae3 in Carbon-Iron Alloys. H. M. Howe and A. G. Levy. II. Thermal and Microscopical Examination of Professor Howe's Standard Commercial Steels. G. K. Burgess, J. J. Crowe, and H. S. Rawdon. III. Discussion of the Existing Data as to the Position of Ae3. H. M. Howe. Three connected papers. Ills. 21,500 w. *Bul Am Inst of Min Engrs*—June, 1913. No. 43261 F.

Test Bars for Non-Ferrous Alloys. Jesse L. Jones. Outlines work to determine a standard bar, giving tests and conclusions. Ills. 2200 w. *Am Inst of Metals*—Sept., 1912. No. 43291 N.

The Effect of Stretching on the Properties of Metallurgical Products (Influence de l'étirage sur les propriétés des produits métallurgiques). Leon Guillet. Tabulated results of a series of experiments. 4000 w. *Rev de Metal*—June, 1913. No. 43065 H.

Electro-Analysis of the Copper Alloys. J. G. Fairchild. Gives suggested procedure. 2000 w. *Met & Chem Engng*—July, 1913. No. 43485 C.

Alloying Aluminum with the Rarer Metals. C. H. Ivins. Read before the British Found. Assn. Explains the peculiar behavior of this white metal when mixed with other metals, and how the physical properties are affected. 2000 w. *Foundry*—Aug., 1913. No. 44094.

The Determination of Oxygen in Copper and Brass. T. West. Read before the Inst. of Metals. Deals with the methods used and describes experiments carried out. Ills. 3000 w. *Mech Engr*—Sept. 5, 1913. No. 45148 A.

Theories on Metallic Alloys and Their Industrial Applications (Les théories sur les alliages métalliques et leurs applications industrielles). A. Portevin. A study of the chemical and crystalline dissimilarity of alloys and factors influencing their crystalline structure. 10400 w. *Mem Soc Ing Civ de France*—June, 1913. No. 45302 G.

The Hardness of Aluminum-Silver Alloys (Sur la dureté des alliages aluminium-argent). G. Le Grix and W. Broniewski. A new instrument for testing these alloys and the experiments performed. Ills. 2500 w. *Rev de Metall*—Aug., 1913. No. 45326 H.

Nomenclature of Non-Ferrous Alloys. Dr. G. K. Burgess. Discusses the need of making provision for more orderly naming of non-ferrous alloys. 1500 w. *Am Inst of Metals*—Oct., 1913. No. 46283 N.

Recent Improvements in Non-Ferrous Alloys. C. Vickers. Outlines improvements effected by the use of recently discovered elements. 5000 w. *Foundry*—Oct., 1913. Special. No. 45706 C.

Report of Official Chemists of the American Institute of Metals, 1913. Carl F. Woods. Review of advances made in new alloys, utilization of rare metals, and other subjects of interest to metallurgists. 4000 w. *Am Inst of Metals*—Oct., 1913. No. 46280 N.

The Approximate Melting Points of Some Commercial Copper Alloys. H. W. Gillett and A. B. Norton. Reports tests and methods used in a study of commercial casting alloys. 2000 w. *Am Inst of Metals*—Oct., 1913. No. 46279 N.

See also Castings, under *Machine Works and Foundries*.

Alloy Steels

Notes on Ruff's Carbon-Iron Equilibrium Diagram. Henry M. Howe. A critical discussion. Ills. 16700 w. *Bul Am Inst of Min Engrs*—Nov., 1912. No. 37546 F.

Analysis of the Total Carbon in Steels and Ferro-Alloys by Combustion with Compressed Oxygen (Dosage du Carbone Total des Aciers et des Ferroalliages par Combustion sous Pression d'Oxygène). P. Mahler and E. Goutal. Describes apparatus, method of conducting analysis, and some results. Ills. 7000 w. *Rev de Metall*—Oct., 1912. No. 37498 H.

Aluminum

Changes in the Physical Properties of Aluminum and Its Alloys, with Special Reference to Duralumin (Änderungen der physikalischen Eigenschaften von Aluminium und dessen Legierungen unter besonderer Berücksichtigung des Duralumins). L. M. Cohn. A study of the

Aluminum Alloys

effects of air and water. 3000 w. Elek u Masch—May 18, 1913. No. 43041 D.

Alloying of Aluminum. C. H. Iverson. Read before the British Found. Assn. Information concerning the making of these alloys, and especially alloys with some of the rarer metals. 2500 w. Mech Engr—June 27, 1913. No. 43636 A.

Aluminum Alloys

Aluminum Alloys. C. E. Cox. Gives data collected concerning elements which will alloy with aluminum and their effects. Discussion. 3000 w. S A E Bul—Sept., 1913. No. 46120 N.

Boiler Plate

How Boiler Plate Is Made. Charles H. Bromley. Follows the material through the mills from the stock pile to the finish. Ills. 1200 w. Power—Aug. 19, 1913. No. 44440.

Boronized Copper

Progress of Work on Boronized Copper. Dr. E. Weintraub. Read before the Am. Inst. of Metals. An account of the investigation with details of the process of boronizing copper. 2000 w. Chem Engr—March, 1913. No. 40928 C.

Brass

Observations and Notes on the Season Cracking of Brass. Considers the various causes, deciding that the principal cause is imperfect die-work. Ills. 2000 w. Brass Wld—May, 1913. No. 42425.

Nickel-Brass (Les laitons au nickel). Leon Guillet. A micrographic study of these alloys; their mechanical properties, theoretical, practical and general conclusions. Ills. 4000 w. Rev de Metall—Sept., 1913. No. 45327 H.

See Brass Founding, under *Machine Works and Foundries*, and Etching and Electrometallurgy, under *ELECTRICAL ENGINEERING, Electro Chemistry*. See also Alloys, under *Materials of Construction*.

Bronzes

Note on the Wear of Bronzes. A. Portevin and E. Nusbauer. Describes researches undertaken to determine the influence of the chemical composition on the wear of bronzes. 1800 w. Am Found Assn—Dec., 1912. No. 39517 N.

The Thermal Diagram, with Special Reference to the Bronzes. William Campbell. Shows that the "Thermal Diagram" of the copper-tin alloys, though it appears complex is fairly simple when each section is examined by itself. 2500 w. Am Inst of Metals—Sept., 1912. No. 43287 N.

Calcium Carbide

The Manufacture of Calcium Carbide. From the *Jour. of the Soc. of Chem., Ind.* Describes details of manufacture, and

MATERIALS OF CONSTRUCTION**Galvanized Iron**

some of the uses. 2500 w. Chem Engr—July, 1913. No. 43858 C.

Carborundum

Carborundum Refractories. F. J. Tone. Considers the physical properties of carborundum. 1500 w. Met & Chem Engng—Sept., 1913. No. 44965 C.

Cast Iron

Notes on Titanium and on the Cleansing Effect of Titanium on Cast Iron. Bradley Stoughton. Gives results of a research into the literature of titanium; and of a series of tests upon the effect of titanium on iron castings. 12000 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37548 F.

Corrosion

Manufacture of Soft Steel Tubes in Relation to Corrosion. F. N. Speller. Considers theories of corrosion and the influence of manufacture. 2000 w. Chem Engr—Jan., 1913. No. 39500 C.

American Ingot Iron Versus Steel. G. F. Ahlbrandt. Shows the difference of manufacture, explaining the real cause of corrosion and why American ingot iron is superior to steel from a rust-resisting standpoint. Discussion. Ills. 6500 w. Jour Cleveland Engng Soc—Jan., 1913. No. 39396 D.

Fatigue

So-Called "Crystallization Through Fatigue." F. Rogers. Read before the Iron & Steel Inst. A criticism of this idea, claiming that fatigue will not cause crystallization. 2000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45188 A.

"Crystallization of Steel Through Fatigue." F. Rogers. A criticism of this generally accepted idea. Ills. 1500 w. Ir Age—Sept. 11, 1913. No. 45051 C.

Fire Bricks

Melting Points of Fire Bricks. C. W. Kanolt. Reports experiments conducted in an Arsem graphite resistance vacuum furnace, discussing results. Ills. 4500 w. U S Bureau of Stand. Tech. paper No. 10—June 15, 1912. No. 38656 N.

Forgings

Comparative Merits of Mild Steel and Wrought Iron. J. Aitken. Suggestions which will aid in deciding which material is more suitable for certain uses. 900 w. Mech Wld—Jan. 17, 1913. No. 39471 A.

Galvanized Iron

Structure of Galvanized Iron. Arthur Walker and William H. Walker. Considers the structure of zinc protected iron under the heads of hot galvanized, standardized, and wet or electro-galvanized. Ills. 1600 w. Am Found Assn—Sept., 1912. No. 39936 N.

Structure of Galvanized Iron. Walter Arthur and William H. Walker. Consid-

Consult Classification of the Index. See page 9.

German Silver

MATERIALS OF CONSTRUCTION

Metals

ers hot galvanized, sherardized, and wet or electrogalvanized iron. Ills. 1200 w. Am Inst of Metals—Sept., 1912. No. 43290 N.

Removing Zinc from Galvanized Iron Scrap. Describes a method of stripping recently patented by Joseph McFetridge, which allows both the iron or steel sheet and the zinc to be saved. 1000 w. Brass Wld—Aug., 1913. No. 44510.

Some Notes on the Life of Galvanized Pans (Einiges über die Lebensdauer von Verzinkungspfannen). C. Diegel. A critical study into English and German products comparing, composition and durability. Plates. 4000 w. Zeit des Ver deutscher Ing—July 19, 1913. No. 44652 D.

See also Wire, under *Materials of Construction*.

German Silver

The Microstructure of German Silver. O. F. Hudson. Read before the Inst. of Metals. Illustrates typical microstructures of cold-rolled and annealed samples, cast alloy and other specimens. 900 w. Engng—March 14, 1913. No. 40830 A.

Glass

A Machine for Blowing Window Glass. Illustrated description of the Sievert process which has been used successfully in European factories. 2500 w. Sci Am—July 19, 1913. No. 43778.

Gun-Metal

Practical Heat Treatment of Admiralty Gun-Metal. H. S. Primrose and J. S. G. Primrose. Read before the Inst. of Metals. Illustrated report of research work to find a reliable method of improving gun-metals. 3500 w. Engng—April 18, 1913. No. 41771 A.

Iron

Iron—Where Does It All Go? D. C. Wilson. Calls attention to some of the uses to which iron is applied. 700 w. Am Found Assn—Oct., 1913. No. 46266 N.

Lead

Lead Bending and Lead Beating. William Hutton. First of a series of articles on methods of bending lead pipe and working sheet lead. Ills. 2500 w. Met Work—Dec. 20, 1912. Serial. 1st part. No. 38305.

Materials

The Storing and Handling of Material. Seven contributions from different writers which discuss various phases of this problem. Ills. 4000 w. Ry Age Gaz—Jan. 24, 1913. No. 39404.

Metallography

Analysis of Steel Sheets by the Microscope. C. Arthur White. Read before the Am. Ir. & St. Inst. Micrographs, and

discussion of some of the requisites of material and manufacturing operations for the production of commercial steel sheets. 2500 w. Met Work—Nov. 15, 1912. No. 37556.

Microscopical Analysis of Steel Sheets. C. Arthur White. Read before the Am. Ir. & St. Inst. Shows the value of microscopic and chemical analyses. Ills. 2000 w. Ir Age—Nov. 14, 1912. No. 37752 C.

High-Powered Microscopes (Microscope à Longue Portée). Felix Robin. Their application in the study of changes in alloys due to heat. Ills. 11000 w. Bull Soc d' Encour—Oct., 1912. No. 37495 E+F.

The Different Kinds of Occluded Slag in Steel; Their Probable Origin and Their Reduction (Ueber verschiedene Arten von Schlackeneinschlüssen im Stahl, ihre mutmassliche Herkunft und ihre Verminderung). Fr. Pacher. A metallographic study of various steels along such lines. Discussion. Ills. 5800 w. Stahl u Eisen—Oct. 3, 1912. No. 37400 D.

Use of the Microscope in the Study of Metals. Edwin F. Cone. Gives cases in which the microscope disclosed causes of steel failures. Ills. 1500 w. Ir Age—Oct. 16, 1913. No. 45913 C.

The Boiling of Metals. Joseph W. Richards. Reviews the vaporization of water, showing the analogy in the boiling or vaporization of metals. 2200 w. Am Inst of Metals—Oct., 1913. No. 46278 N.

Metals, Crystalline and Amorphous. Walter Rosenhain. Read before the British Assn. Describes results of experimental research to find evidence of the existence of an amorphous film. 4000 w. Engng—Oct. 10, 1913. Serial, 1st part. No. 46242 A.

The Work in Metals at the Bureau of Standards. Dr. G. K. Burgess. Outlines some of the work in metals that has been completed, and investigations under way. 4000 w. Am Inst of Metals—Oct., 1913. No. 46282 N.

Fine Texture in Pig and Malleable Iron (Kleingefüge des Roheisens und des schmiedbaren Eisens). Fr. Erbreich. A metallographic study of alloy percentages inducing close grains. Ills. Serial. 1st part. 2800 w. Giess Zeit—Sept. 15, 1913. No. 46022 D.

Metals

The Intercrystalline Cohesion of Metals. Walter Rosenhain and Donald Ewen. Read before the Inst. of Metals. An illustrated account of experimental work to obtain evidence supporting the amorphous-cement theory. 6500 w. Engng—Sept. 12, 1913. No. 45403 A.

Micrography

MATERIALS OF CONSTRUCTION

Steel

Micrography

The Micro-Structure of Metals. H. B. Pulsifer. Illustrations and record of work at Armour Institute. 2500 w. Chem Engr—June, 1913. No. 43161 C.

Photomicrographic Examination of Broken Crank Shaft. Report of the Examination made at the Naval Engineering Experiment Station, Annapolis, Md. Ills. 1500 w. Jour Am Soc of Nav Engrs—May, 1913. No. 42919 H.

Muntz Metal

Influence of Impurities on Muntz Metal. F. Johnson. Describes experiments made with a view to placing on record the exact cause of the brittleness, coarsely crystalline features, and general bad properties of Muntz metal when made from certain brands of copper, as distinct from the good properties when made from other brands of copper. Ills. 1000 w. Engng—Feb. 28, 1913. No. 40483 A.

Niello

The Manufacture of Niello (Frequently Called "Nielled" Silver). Describes this form of silver ornamentation. 1200 w. Brass Wld—Oct., 1913. No. 45996.

Rope

The Manufacture of Manila Rope. C. W. Hunt. Illustrated article giving information concerning rope manufacture and its use for hoisting, etc. 3500 w. Sci Am Sup—Dec. 28, 1912. No. 38633.

Rubber

Artificial Rubber. Editorial review of work in this field, especially referring to a recent paper by Dr. F. Mollwo Perkin. 2000 w. Engng—Dec. 13, 1912. No. 38523 A.

Natural and Synthetic Rubber. F. Mollwo Perkin. Reviews the history of rubber from its first mention in 1536, and the various uses made of it in early times, the improvements and applications developed, etc., the methods of gathering, curing, vulcanizing, etc. Also discusses rubber substitutes, and synthetic rubber. 14500 w. Jour Soc of Arts—Dec. 31, 1912. No. 38383 A.

The Determination of Total Sulphur in India Rubber. C. E. Waters and J. B. Tuttle. Gives results of comparative tests of different variations of the method of Henriques. 3000 w. Bul Bureau of Stand—Nov. 1, 1912. No. 38661 N.

Making Sheet Rubber. A picture story told chronologically of making sheet-rubber used for inner tubes and tire casings. 2500 w. Automobile—July 3, 1913. Serial, 1st part. No. 43400.

An Elasticity Recording Meter and Its Applications to the Study on Some Rubber and in the Determination of Their Respective Values (Elasticimètre enreg-

istreur. Applications à l'étude des caoutchoucs et à la détermination de leur valeur respective). C. Chêneveau and F. Heim. Description of meter and results of tests on vulcanized and crude rubber. Ills. 10000 w. Bull Soc d'Encour—July, 1913. No. 45314 E + F.

Scrap Metal

The Scrap Metal Business in the United States. A general résumé of the scrap metal business for 1912 as given in Bul. No. 117 of the U. S. Geol. Survey. 2000 w. Brass Wld—July, 1913. No. 43742.

Scrap Steel

Novel Scrap Tool Steel Reclamation Methods. J. J. Sheehan. Describes practice at several railroad shops and shows savings effected. 1800 w. Ir Trd Rev—Aug. 7, 1913. No. 44226.

Reclamation of Scrap Tool Steel. J. J. Sheehan. Read before the Ry. Tool Foremen's Assn. Describes the process by which the recovery was made. 1700 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44265 C.

Reclaiming Scrap on the Santa Fe. Illustrates and describes the plant at Corwith, Ill., for reclaiming scrap. Material valued at half a million dollars was reclaimed during the past year at these shops. 3000 w. Ry Age Gaz—Aug. 15, 1913. No. 44400.

Semi-Steel

Semi-Steel. M. Riddell. Read before the British Found. Assn. Considers the difficulties connected with the melting of steel in the cupola and the prevalence of hard spots and sponginess. Ills. 4000 w. Mech Engr—Aug. 8, 1913. No. 44454 A.

A British Founder's Viewpoint of Semi-Steel. M. Riddell. Discussion of this process as practiced in English foundries, with suggestions for overcoming difficulties. 4000 w. Foundry—Sept., 1913. No. 44858.

Solder

Soldering Fluxes for Soft Solder. W. Arthur. Information concerning a number of fluxes and their qualities. Ills. 1000 w. Am Inst of Metals—Oct., 1913. No. 46276 N.

Steel

The Solid Non-Metallic Impurities in Steel. Henry D. Hibbard. Read before the Int. Cong. for Test. Mat. Discusses the causes of oxidation products in steel which are termed sonims and how they may be eliminated. 4500 w. Ir Trd Rev—Nov. 21, 1912. No. 37720.

The Heat and Mechanical Treatment of Steel (Sur le traitement thermique et mécanique des aciers). L. Grenet. Study

Tool Steel

MATERIALS OF CONSTRUCTION

Wire

on the constitution of steel and the nature of its transformation at high temperatures. Ills. 5400 w. Tech Mod—Nov. 15, 1912. No. 37512 D.

The Selection of Steel in Mechanical Construction (La scelta degli acciai nelle costruzioni meccaniche). D. Fiorentini. A discussion on the relative qualities of various grades of steel and alloy-steels. Ills. Serial, 1st part. 3000 w. Monit Tec—July 20, 1913. No. 45363 D.

Structural Steel

Structural Steel Fabrication at Rankin, Pa. Illustrates and describes the general features and equipment of the newer part of the plant, near Pittsburgh, of the McClintic-Marshall Construction Co. 2500 w. Ir Age—Aug. 28, 1913. No. 44771 C.

Tar

Tests of Tar for Furnace Linings. R. Weissgerber. Considers methods of testing tars, and the most suitable qualities intended for use in steel works. 1500 w. Ir & Coal Trds Rev—May 16, 1913. No. 42550 A.

Tool Steel

The Hardening of Carbon and Low-Tungsten Tool Steels. Shipley N. Brayshaw. Third and concluding article of a serial, discussing tensile tests, and the interpretation of the results. Ills. 2000 w. Engineering Magazine—Dec., 1912. No. 37791 B.

Relation of Price of Tool Steel to Manufacturing Costs. D. G. Clark. Discusses the indirect relation of the cost of the tools to the cost of production. 1000 w. Mach, N Y—Nov., 1912. No. 37166 C.

Tool Steel for the U. S. Navy. Lewis Hobart Kenney. Reports the study made of tool steels, giving tests of tungsten tool steel, and carbon tool steels, etc. Ills. 8700 w. Soc of Nav Archts & Marine Engrs, No. 13—Nov. 21, 1912. No. 37696 N.

Steels for Taps, Drills and Milling Cutters. Considers results of experiments made by the Winter Bros. Co., of Wrentham, Mass. 2000 w. Mach, N Y—Nov., 1912. No. 37162 C.

Tool Steel from a Salesman's Point of View. C. M. Bigger. From a paper read before the Metal Trds. Foremen's Club. Considers the adaptations of the various classes of definite lines of service, with suggestions for heat treatment. 3500 w. Ir Age—March 20, 1913. No. 40715 C.

The Progress of German Steel Works in the Production of Highly Alloyed

Speed Steels (Die Fortschritte deutscher Stahlwerke bei der Herstellung hochlegierter Schnellarbeitsstähle). G. Schlesinger. A critical study of the manufacture and durability of German made tool steel. Ills. 3000 w. Stahl u Eisen—June 5, 1913. No. 43504 D.

Modern Tool Steels and High-Speed Tool Alloys. George S. Armstrong. This first article of a series considers the elements of cutting speed and the factors affecting it and the development of tool steels and alloys. Ills. 2000 w. Engineering Magazine—Sept., 1913. No. 44766 B.

Modern Tool Steels and High-Speed Tool Alloys. George S. Armstrong. This second article of a serial deals with the processes of manufacture and mechanical treatment in American and British practice. Ills. 3000 w. Engineering Magazine—Oct., 1913. No. 45544 B.

Modern Tool Steels and High Speed Tool Alloys. George S. Armstrong. Discusses applications of carbon and alloy steel to specific uses in this third article of a series. Ills. 1000 w. Engineering Magazine—Nov., 1913. No. 46303 B.

See also Scrap Steel, under *Materials of Construction*, and *Electrometallurgy*, under *MINING AND METALLURGY, Iron and Steel*.

Tungsten

Applications of Ductile Tungsten. C. G. Fink. Beside its use in incandescent lamps, it is applied in electrical contacts, tungsten furnaces, tungsten gauze, and many other uses. 1200 w. Chem Engr—March, 1913. No. 40927 C.

Vanadium Steel

Vanadium Steel and Its Application in Locomotive Construction. George L. Norris. Information concerning the improvement in steel by combining vanadium, the classes and applications, giving records of service, and a general discussion. Ills. 7000 w. Pro W Ry Club—Sept. 16, 1913. No. 46285 C.

Wire

Experiments on Galvanized Wires (Untersuchungen an verzinkten Drähten). Hans Fleissner. Micrographic studies of the several galvanizing processes on wire, under varying conditions. Plates. Serial, 1st part. 4000 w. Oest Zeit f Berg u Hütten—July 12, 1913. No. 44622 D.

Wire and Wire Rods. Kenneth B. Lewis. Reviews the history of the production of wire and of wire rod rolling. Ills. 5000 w. Ir Trd Rev—Oct. 2, 1913. Serial, 1st part. No. 45626.

MEASUREMENT

Calculator

Calculator

Power Plant Log Calculator. Walter N. Polakov. Gives the construction of the calculator with full directions for its use. 600 w. Power—April 29, 1913. No. 41680.

An Automatic Astronomical Calculator. Arthur H. Brown. Illustrated description of a new invention which renders unnecessary the long and tedious computations by nautical tables. 3500 w. Sci Am Sup—July 19, 1913. No. 43782.

The Forms of Jointed Calipers. Fred Horner. Illustrates and describes types. 1000 w. Mech Wld—July 4, 1913. Serial, 1st part. No. 43715 A.

Calibration

Calibration of Emery Testing Machine. A. H. Emery, Jr. Illustrated description of a huge calibrating machine built especially to calibrate the testing machine just erected at the Nat. Bureau of Standards, Washington. 1200 w. Am Mach—Jan. 9, 1913. No. 38941.

Calorimeters

Throttling Calorimeters. Illustrates and explains the principle, giving an example in which the calorimeter is used to determine the percentage of moisture in steam. 1500 w. Power—Sept. 23, 1913. No. 45277.

Centering

Device for Determining Central Points and Central Axes (Verfahren zur Bestimmung von Mittelpunkt und Mittelachsen). G. Rosenfeldt. An ingenious device used for determining rapidly and with accuracy the exact center of circles, flanges, pipes, etc. Ills. 2200 w. Zeit f Werkzeug—Dec. 15, 1912. No. 39029 D.

Cinematometry

Use of Pitot Tube in Air Measurements. Frank L. Busey. Describes the operation and form of tube, explaining the theory and use. 1200 w. Power—Feb. 4, 1913. No. 39662.

Colorimeter

A New Precision Colorimeter. P. G. Nutting. Describes a monochromatic analyzer designed to be a practical working instrument of wide range. Ills. 1000 w. Bul Bureau of Stand—March 15, 1913. No. 42931 N.

Colorimetry

Quantitative Spectrum Analysis. G. A. Shook. Discusses colorimeters and the law of light absorption. 3000 w. Met & Chem Engng—Sept., 1913. No. 44968 C.

Crankshaft Stresses

An Analysis of Crankshaft Stresses. K. W. Najder. Analytical determination of stresses in two- and three-bearing,

Dynamometers

four-cylinder crankshafts. Ills. 1500 w. Mach, N. Y.—July, 1913. No. 43363 C.

Decimal System

An English Decimal System of Weights and Measures. P. S. Bond. Suggests the adoption of a decimal system based upon the inch as a unit and in all other respects similar to the French system. 1600 w. Eng Rec—April 5, 1913. No. 41120.

Diagrams

Load-Extension Diagrams. W. E. Dalby. Read before the Royal Soc. Describes load-extension diagrams taken with the optical local-extension indicator. The apparatus is automatic in its action. 3500 w. Engng—July 18, 1913. No. 43969 A.

Load-Extension Diagrams Taken with the Optical Local-Extension Indicator. W. E. Dalby. Read before the Roy. Soc. The physical properties of gun-metal, brass, and phosphor-bronze are disclosed by diagrams and microphotographs. Ills. 3000 w. Mech Engr—Aug. 15, 1913. No. 44718 A.

Dimensions

Dimensional Arithmetic. Sydney H. Stelfox. Outlines a method, illustrating by example, and stating the advantages of the system. 1500 w. Engng—April 11, 1913. No. 41392 A.

Drafting

The Drafting Room and Its Opportunities for the Young Engineering Graduate. B. K. Read. Remarks on the advantages of the drafting room for young engineers, particularly the direct contact with the management. 1200 w. Wis Engr—April, 1913. No. 42332 C.

Free Hand Sketching in Mechanical Work. Albert A. Dowd. Calls attention to the value of sketching as applied to mechanics, pointing out faults and suggesting improvements. Ills. 3000 w. Mach, N Y—May, 1913. No. 41786 C.

Drawing

Hints on Drawing and Tracing. Suggestions for securing exactness and accuracy are given. 1200 w. Mech Wld—July 18, 1913. Serial, 1st part. No. 43961 A.

Dynamometers

The Measurement of Dynamic Actions and Its Application in the Regular Examination of the Permanent Way of Railways. L. Schlusell. A description of the method. 8000 w. Bul Int Ry Cong—Dec., 1912. No. 38676 G.

Garland's Magnetic Absorption Dynamometer. Ferdinand Jehle. Enumerates the requirements of a dynamometer for testing automobile motors, and illustrates and describes the instrument named. 1000

Consult Classification of the Index. See page 9.

Fatigue

w. S A E Bul—Feb., 1913. No. 40396 N.
The Electric Dynamometer in the Automobile Industry. Carl F. Scott. Explains the principles of the instrument and its advantages in testing all types of gasoline engines. Ills. 2500 w. Gen Elec Rev—May, 1913. No. 41810 C.

Engineering Units

Fixation of Units by Legislative Means (La fixation des unités par voie législative). R. de Baillache. Suggestions for coherent terms in engineering nomenclature, and their establishment by law. 9000 w. Rev Gen des Sciences—Jan. 15, 1913. No. 40061 D.

Fatigue

The Elastic Hysteresis of Steel. Bertram Hopkinson and G. Trevor Williams. Read before the Royal Soc. An account of experiments made with the alternating stress machine with the object of measuring the energy dissipated by elastic hysteresis when steel undergoes cyclical variations of stress within the elastic limit. 2500 w. Engng—Dec. 13, 1912. No. 38526 A.

Repeated Stress Testing. J. B. Kommers. Discusses preliminary experiments in a study of an alternating stress test which stressed the material beyond the elastic limit. Ills. 2000 w. Wis Engr—Nov., 1912. No. 38562 C.

A New Machine for Alternating Load Tests. Bernard P. Haigh. Read before the British Assn. Illustrated description of a machine designed for wire-testing and the method of standardizing the machine, by which the results are obtained accurately. 3800 w. Engng—Nov. 22, 1912. No. 38033 A.

The Witton-Kramer Fatigue-Tester. Illustrated detailed description of an apparatus designed by Professor Kapp. 1800 w. Engng—Dec. 13, 1912. No. 38520 A.

Note on Some Cases of "Fatigue" in the Steel Material of Steamers. S. J. P. Thearle. Read before the Inst. of Nav. Archts., at Glasgow. Gives results of investigations and the remedies. Ills. 1000 w. Engng—June 27, 1913. No. 43644 A.

Flue Gas Recorders

The Ward CO. Recorder. Illustrated description of the instrument and its method of operation. 1800 w. Engng—March 7, 1913. No. 40710 A.

CO. Diagrams from Actual Practice. A. Bement. Gives a number of cases in which the results of analysis are connected with the performance of the fire. 1500 w. Power—March 25, 1913. No. 40796.

MEASUREMENT**Friction**

Notes on the Friction Between Wood and Iron, Especially Concerned with Brake Appliances for Power Measurement (Beiträge zur Kenntniss der Reibungsverhältnisse zwischen Holz und Eisen, insbesondere bei Bremsenrichtungen für Leistungsmessung). Heinrich Schmetje. Test apparatus and tests to determine conditions. Ills. Serial, 1st part. 2600 w. Turbine—Aug. 5, 1913. No. 44668 D.

Gages

External and Internal Thread Gages. L. L. Haas. Tables and data covering the construction. Ills. 1500 w. Am Mach—Feb. 27, 1913. No. 40141.

The Measurement of Large Internal Diameters. George W. Burley. Describes the rod gauge and its use. 1200 w. Prac Engr—Jan. 30, 1913. No. 39782 A.

Gas Measurement

Pitot Tubes for Gas Measurement. W. C. Rowse. An account of experiments to investigate the reliability of the pitot tube as a means of measuring gases, and to ascertain which forms give correct and which incorrect results. Ills. 7000 w. Jour Am Soc of Mech Engrs—Sept., 1913. No. 45416 D.

Hardness

Calculated Determination of Hardness by the Hertz Methods and Tests on the Practicability of the Results (Rechnerische Ermittlung der Härte nach Hertz und Versuche über die praktische Verwendbarkeit der Ergebnisse). Bruno Schwartz. A study of the Hertz formulae and compared results with testing machines. Ills. 4200 w. Glaser's Ann—Sept. 1, 1913. No. 46012 D.

Heat Transmission

A Technical Process for Investigating the Heat Conducting Capacity of Plate-Shaped Material (Ein technisches Verfahren zur Ermittlung der Wärmeleitfähigkeit plattenförmiger Stoffe). Richard Poensgen. Laboratory results on stone, wood, cork, linoleum, asphalt, concrete, etc. Ills. 3500 w. Zeitschr des Ver deutscher Ing—Oct. 12, 1912. No. 37449 D.

Horsepower

What Is a Horsepower? William Kent. A remonstrance against the Bureau of Standards' proposal to make the horsepower the exact equivalent of 746 watts. Also editorial. 2800 w. Power—Jan. 28, 1913. No. 39494.

The Measurement of Horsepower. W. Morgan and E. B. Wood. Discusses briefly the merits and demerits of types of absorption dynamometers and describes experimental investigations of the fan

Hydrometry

brake. Ills. 3000 w. Soc of Auto Engrs—June, 1913. No. 43300 N.
See same heading, under *Automobiles*.

Hydrometry

The Present Status of Hydrometry (Der heutige Stand der Hydrometrie). A. Budau. A review of present methods in the measurement of the flow of water. Ills. Serial, 1st part. 3000 w. Die Turbine—May 20, 1913. No. 43538 D.

Indicators

A Power Counter for Indicators. Illustrated description of a Maihak indicator fitted with a Böttcher "power counting" device. 1300 w. Engr, Lond—Oct. 3, 1913. No. 45868 A.

An Energy Chart for Gas. T. B. Morley. Gives a graphical method of measuring the specific heat of gases. 2200 w. Engng—Oct. 3, 1913. No. 45857 A.

Inertia

Graphical Method of Determining Moments of Inertia. R. Kraus. Explains Mohr's method of graphical determination. 1200 w. Mach, N Y—May, 1913. No. 41790 C.

Kinematics

Velocity and Acceleration Diagrams. W. W. Padfield. Explains certain methods of dealing graphically with problems in kinematics, demonstrating their applicability. 2200 w. Engng—Nov. 22, 1912. No. 38030 A.

Laboratories

The Krupp Steel Work Laboratories. Alfred Gradenwitz. Illustrated description of the laboratory equipment at Essen. 2000 w. Ir Age—Feb. 20, 1913. No. 39928 C.

The New Locomotive Laboratory at the University of Illinois. Edward C. Schmidt. Illustrated description of this testing plant and its work, discussing the new equipment. 6000 w. Pro W Ry Club—March 18, 1913. No. 41686 C.

Locomotive Laboratory, University of Illinois. Edward C. Schmidt. Explains the great benefits derived from locomotive testing plants, giving illustrations and description of details of the laboratory. 5500 w. Ry Mas Mech—April, 1913. No. 41569 C.

The Laboratories of the Modern Factory. E. F. Lake. Illustrates and describes the chemical, physical and metallographic apparatus and investigations of the Studebaker Corporation, Detroit, Mich. 3000 w. Ir Age—Aug. 21, 1913. No. 44488 C.

The Russell Sage Laboratory. Illustrated detailed description of this new building and its equipment. 3500 w. Ir Trd Rev—July 31, 1913. No. 44100.

MEASUREMENT

Loads

Graphical Determination of Bearing Loads. Fritz Huber. Gives application of this method to the determination of the loads on all of the transmission bearings of a double chain driven car. 7000 w. Horseless Age—Oct. 15, 1913. No. 45995.

Lubricants

Oil Testing. Illustrated description of a machine for recording the behavior of lubricants under working conditions, with particular regard to the absorption of power. 2000 w. Autocar—Sept. 6, 1913. No. 45138 A.

Hislop's Oil-Testing Machine. Illustrates and describes a machine devised for testing the lubricating qualities of oils and greases. 1200 w. Engng—Aug. 22, 1913. No. 44919 A.

Magnetic Testing

Magnetic Measurement in Iron and Steel Work. Illustrates and describes some of the instruments used. 2000 w. Elect'n, Lond—Dec. 27, 1912. No. 38911 A.

Manometers

A New Manometer. Illustrated description of the Spurge manometer, and explanation of its use for the measurement of pressure. 1800 w. Engr, Lond—May 16, 1913. No. 42546 A.

Experiments with a Tilting Manometer for Measurement of Small Pressure Differences. J. R. Pannell. Notes on the behavior of the pressure-gauge described, and some improvements introduced. Ills. 1600 w. Engng—Sept. 12, 1913. No. 45400 A.

Metal Tests

Breakdown Tests of Metals. O. Boudouard. Read before the Int. Assn. for Test Mat. Illustrates and describes the apparatus and method of testing, discussing results. 3500 w. Mech Engr—Jan. 24, 1913. No. 39787 A.

Strength and Durability of Iron, Steel, and Bronzes at High Temperatures. Gives results of two series of tests in tensions and in torsion made under high temperature conditions by L. W. Spring and I. M. Bregowsky in Chicago. 800 w. Eng News—Feb. 20, 1913. No. 39978.

Metallographic Testing. Considers the scope of the science of metallography, thermal analysis, microscopic analysis, chemical and mechanical testing as carried out at the Bureau of Standards. 16 pp. U S Bureau of Stand—Circ 42. No. 45412 N.

Hydraulic Machine for Testing Metals (Machine hydraulique à essayer les métaux). M. Genes. General description of the "Schiller" machine. Ills. 1000 w. Rev de Metall—Sept., 1913. No. 45328 H.

Metal Tests

Meters

The Effect of Drill-Holes on the Resistance of Soft Steel (Influence du perçage sur la résistance des aciers doux). C. Birault. Results of tests tending to show the weakening effect of rivet holes. Ills. 2200 w. *Genie Civil*—July 19, 1913. No. 45341 D.

Meters

See also Repair Shop, under *Machine Works and Foundries*.

Metric System

Simple Approximate Metric Conversions. Albert A. Carey. Gives simple rules for quickly converting metric measurements to those of the English system with approximate accuracy. 2200 w. *Power*—Feb. 18, 1913. No. 39894.

Oil Tests

The Evaporation Test for Mineral Lubricating and Transformer Oils. C. E. Waters. Describes work to determine the differences in the amounts of evaporation when a given weight of oil was heated with a greater or less surface area exposed. 13 pp. *Tech Paper, Bureau of Stand*—No. 13. No. 42927 N.

Orifices

The Efflux of Steam from Guide Blades and Nozzles. Dr. August Loschge. Abstract, with emendations by the author, of a paper published in the *Zeit. Ver. Deut. Eng.* Report of experimental research. Ills. 3000 w. *Engng*—Oct. 17, 1913. No. 46248 A.

Permeameter

A New Universal Permeameter (Sur un nouveau perméamètre universel). A. Ilivici. A new instrument for measuring the permeability of test pieces of steel, sheet iron and iron wire. Ills. 2800 w. *Bul Soc Int d Electriciens*—June, 1913. No. 43568 F.

Pipe Friction

Determination of the Frictional Resistance of Gases in Pipes and Conduits (Die Bestimmung des Reibungswiderstandes von Gasen in Rohrleitungen und Strecken). Herr Kegel. The derivation of new formulae and curves for air and gases. 2400 w. *Glückauf*—Sept. 13, 1913. No. 45388 D.

Pitot Tubes

The Pitot Tube Applied to the Measurement of Air. Leo Loeb. A rather complete survey of the use of the pitot tube in the measurement of air. Ills. 8000 w. *Jour Am Soc of Nav Engrs*—Nov., 1912. No. 38291 H.

Notes on the Pitot Tube. John Airey. Gives results of experiments, with a summary of the writer's views. 1500 w. *Eng News*—April 17, 1913. No. 41334.

Pitot Tube in Gas Measurement. C. E. McQuigg. A problem is worked out and

MEASUREMENT

curves given for abbreviation of calculations. 1200 w. *Eng & Min Jour*—March 29, 1913. No. 40953.

See also Cinemetry, under *Measurement*.

Pressure Gauges

New Meters for the Pressure and Velocity of Gases and Steam (Neue Messgeräte für Druck- und Geschwindigkeit von Gasen und Dämpfen). H. Lütke. Describes new vacuum and differential meters. Ills. 1700 w. *Stahl u Eisen*—Aug. 7, 1913. No. 44613 D.

Pressures

The Designation of Specific Fluid Pressures (Ueber die Benennung der spezifischen Flüssigkeitsdrucke). Criticisms on the rules for testing fans and compressors as adopted by the Vereins Deutscher Ingenieure. 6000 w. *Die Turbine*—May 20, 1913. No. 43537 D.

Prony Brake

The Prony Brake and Its Use. H. M. Phillips. Explanation of the prony brake, the common errors in its application and directions for using it correctly. 2500 w. *Power*—May 13, 1913. No. 42018.

Pyrometry

Pyrometry in Steel Works. Charles R. Darling. A general account of methods for the measurement of high temperature, which include thermo-couples, thermal radiation pyrometers, electrical resistance methods, optical pyrometers and calorimetric pyrometers. 6000 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38853 D.

Note on the Calibration of Optical Pyrometers. Paul D. Foote. Describes a method of calibrating pyrometers by means of melts of certain metals. 1000 w. *Met & Chem Engng*—Feb., 1913. No. 39689 C.

The Practical Operation of Electrical Temperature Recorders (Der Praktische Betrieb elektrischer Temperaturmessanlagen). Bruno Thieme. Brief outline of the principles of the three types of electrical recorders. 2800 w. *Feuerungs*—Feb. 15, 1913. No. 40561 D.

Electric Temperature Recorders for Foundry Work (Elektrische Temperaturmessapparate für Giessereibetriebe). R. Schwenn. The principles of electric pyrometry, construction of instruments, and leading types. Ills. Serial. 1st part. 2500 w. *Giess Zeit*—March 1, 1913. No. 40520 D.

Pyrometry (La Pyrométrie). M. Gerard. The principles of pyrometry by thermo-electric couples and by radiation; their control and operation, trade uses and ordinary temperatures encountered

Pyrometry

Rotation

MEASUREMENT

Synchroscope

in the principal industries. 4200. Rev Indus—June 28, 1913. No. 43586 D.

Modern Methods of Measuring Temperature. Robert S. Whipple. Considers methods now available for the measurement of temperature. Ills. 11000 w. Inst of Mech Engrs—July 29, 1913. No. 44318 N.

Rotation

A Simple Statement of the Principles of Acceleration Governing the Movement of Rotating Masses (Eine einfache Darstellung der Beschleunigungsverhältnisse bei der Bewegung auf rotierenden Körpern). Erwin Lihotzky. Mathematical study. Diagrams. 3600 w. Die Turbine—Feb. 20, 1913. No. 40559 D.

Sieves

Specifications for and Measurement of Standard Sieves. Gives new sieve specifications adopted Feb. 13, 1912, and methods of measurement and instructions for tests. 6000 w. Bureau of Stand, Circ 39—Dec. 16, 1912. No. 39287 N.

Speeds

Tables of Circumferential Speeds. W. L. Tryon. Gives tables that can be used for gear and belt speeds and also for obtaining the speed of revolving parts of high-speed motors. 1000 w. Am Mach—Dec. 19, 1912. No. 38266.

Standard Samples

Standard Analyzed Samples. Information concerning such samples, their use, preparation, and related matters. 16 pp. U S Bureau of Stand—Circ 25. No. 45411 N.

Steam Meters

Steam Meters. J. A. Knesche. Discusses their prices and operating characteristics. Ills. 3000 w. Engineering Magazine—Dec., 1912. No. 37795 B.

Steam Meters. J. A. Knesche. A study of the mechanical construction and operating characteristics of the leading types. Ills. 4600 w. Engineering Magazine—Jan., 1913. No. 38684 B.

Stresses

The Circular Diagram of Stress and Its Application to the Theory of Internal Friction. O. H. Basquin. An explanation of this method devised by Prof. Otto Mohr, illustrating its use by problems. Discussion. 8000 w. Jour W Soc of Engrs—Nov., 1912. No. 38559 D.

Flat Surfaces Supported by Stay Bolts. A. J. Toppin. Gives tables and curves showing safe working pressures. 2000 w. Power—Dec. 24, 1912. No. 38358.

Stresses and Deflections of Shafts. A. Schein. Gives application of a graphical method based on the theory of Mohr. 2500 w. Am Mach—Dec. 19, 1912. No. 38269.

Stress and Deflection of Shafts. A. Schein. Discusses shafts with three supports. Diagrams. 1800 w. Am Mach—Jan. 2, 1913. No. 38732.

Recent Researches Made at the National Physical Laboratory, Teddington, England, on the Resistance of Metals to Alternating Stresses. T. E. Stanton. An account of investigations of stresses alternating in a continuous cycle, and stresses alternating between definite limits. Ills. 1500 w. Am Found Assn—Dec., 1912. No. 39524 N.

Repeated-Stress Testing. J. B. Komers. Read before the Int. Assn. for Test. Mat. Describes method of making such tests and gives results of tests on various materials. 2500 w. Wis Engr—Dec., 1912. No. 39310 C.

Increase of Bore of High-Speed Wheels by Centrifugal Stresses, with Formulas for Force and Shrink Fits. Sanford A. Moss' paper is discussed briefly. 1200 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41298 D.

Lecture on "Color Photography of Internal Stress in Bodies of Engineering Form." Ernest G. Coker. On the application of polarized light to the study of stress distribution in certain kinds of material under load. Discussion. Ills. 8000 w. Jour W of Scotland Ir & St Inst—Dec., 1912, Jan.-Feb., 1913. No. 41700 N.

The Distribution of Stress Due to a Rivet in a Plate. E. G. Coker and W. A. Scoble. Read before the Inst. of Nav. Archts. Describes a general method for determining both the sum and the difference of the principal stresses at a point in a plate. 3500 w. Engng—March 28, 1913. No. 41144 A.

Stresses in Stayed Cylindrical Shells. C. E. Stromeyer. Read before the Inst. of Naval Archts. Shows a method of estimating these stresses. 1500 w. Mech Engr—March 21, 1913. No. 41007 A.

Stresses in Stayed Cylindrical Shells. C. E. Stromeyer. Read before the Inst. of Nav. Archts. Explains method of estimating the stresses. 1200 w. Engr, Lond—April 18, 1913. No. 41779 A.

See also Fatigue, under Measurement.

Stroboscope

The Stroboscope in Speed Measurements and Other Engineering Tests. David Robertson. Read before the Inst. of Engrs. & Shipbldrs. in Scotland. Describes stroboscopic methods. Ills. 9000 w. Mech Engr—May 9 & 16, 1913. Serial. 2 parts. No. 42282 each A.

Synchroscope

The Synchroscope. John A. Randolph. Explains its principles, its use, and ad-

Tachometry

vantages. 1800 w. Power—Nov. 19, 1912. No. 37617.

Tachometry

Experimental Determination of the Coefficient of Variation in Speed (Die experimentelle Bestimmung des Ungleichförmigkeitsgrades). Wilhelm Riehm. Describes an electric tachograph for recording speeds and the study of the charts so made. Ills. 4000 w. Zeit des Ver deutscher Ing—July 12, 1913. No. 44649 D.

Temperatures

Temperature Conversion Tables. Leonard Waldo. Gives Centigrade and Fahrenheit temperature conversion tables, and explains the rules for conversion. Also gives scale. 1800 w. Bul Am Inst of Min Engrs—April, 1913. No. 41657 F.

Test Bars

A Suggested System of Test Bars for Chillable Irons. Thomas D. West. Describes an original system for making comparative tests of the relative contraction, deflection and strength of chillable cast iron in both of its distinct forms. 1800 w. Am Found Assn—Dec., 1912. No. 39523 N.

Investigation on the Influence of the Shape of Test Bars on the Mechanical Properties of Cast Iron. J. E. Stead. Report of experimental investigations. 1500 w. Am Found Assn—Dec., 1912. No. 39515 N.

On the Influence of the Shape of the Bar and of the Treatment of the Metal Upon the Results of Notched Bar Impact Tests. A. Schmid. Describes experiments and states results. 1500 w. Am Found Assn—Dec., 1912. No. 39512 N.

Testing Machines

A Universal Testing-Machine (Universal-Prüfmaschine). Max Kurrein. Description of the "Immerfertigkeit" machine, built by the Dusseldorfer Maschinenbau-A.-G. Ills. 1500 w. Zeitschr des Ver deutscher Ing—Nov. 30, 1912. No. 38455 D.

Recent Testing Machines for Molded Materials (Neuere Prüfmaschinen für gegossene Körper). Hubert Hermanns. Descriptions of the several machines in use in large German foundry laboratories. Ills. Serial. 1st part. 2400 w. Giess Zeit—Apr. 15, 1913. No. 42124 D.

English and American Apparatus for Material Testing (Einrichtung englischer und amerikanischer Materialprüfungsanstalten). Viktor Luftschitz. Brief descriptions of mechanical devices in laboratory use. Ills. Serial. 1st part. 2500 w. Zeit d Oest Ing u Arch Ver—Apr. 25, 1913. No. 42149 D.

MEASUREMENT

Tests

Largest Precision Testing Machine. A. H. Emery, Jr. Illustrated description of the Emery machine recently erected at the National Bureau of Standards, Washington, D. C. 4500 w. Am Mach—Jan. 2, 1913. No. 38731.

The 1,000-Ton Testing Machine, Emery Construction, of the Bureau of Standards in Washington (Die 1000 t-Materialprüfmaschine, Bauart Emery, des Bureau of Standards in Washington). M. Kurrein. Details of this new hydraulic machine for tension and compression tests. Ills. 5000 w. Zeit des Ver deutscher Ing—July 19, 1913. No. 44651 D.

The Upton-Lewis Fatigue Testing Machine in Sibley College. G. B. Upton. Illustrated description of a new type of fatigue testing machine. 2200 w. Sib Jour of Engng—Oct., 1913. No. 46294 C.

Testing Materials

Practical Testing of Materials. Aims to give precise instructions for the preparation of specimens from rough material; the particular uses of testing machines; and the charting of data and details of testing. 1800 w. Mech Wld—Nov. 15, 1912. Serial. 1st part. No. 37820 A.

The Sixth Congress of the International Association for Testing Materials (VI^e Congrès de l'Association Internationale pour l'Essai des Matériaux). M. Mesnager. Reviews the work of the Congress, convened in New York, September, 1912, and presents abstracts of some papers read. Serial. 1st part. Ills. 3000 w. Génie Civil—Nov. 9, 1912. No. 37523 D.

Test Methods

Present Methods of Testing. Prof. H. Hubert. Read before the Iron & Steel Inst. Considered with special reference to the work of the International Testing Association. 5000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45189 A.

Test Pieces

A New Tensile Test Piece and Molder. K. W. Zimmerschied. Explains the advantages of the form illustrated. 700 w. S A E Bul—May, 1913. No. 42470 N.

Tests

Notes on the Brittleness Test. M. Derihon. Observations made while using the brittleness test as a standard method for steels and forgings. 1500 w. Am Found Assn—Dec., 1912. No. 39521 N.

Break-Down Tests of Metals. O. Boudouard. A study of vibration, describing the testing apparatus and stating results. Ills. 3000 w. Am Found Assn—Dec., 1912. No. 39514 N.

Thermometers

Application of the Methods of Mechanical Testing Adopted for Other Metals to Foundry Pig Testing. A. Damour. Proposals for fixing a "specimen of international type." 1500 w. Am Found Assn—Dec., 1912. No. 39516 N.

Thermometers

The Correction for Emergent Stem of the Mercurial Thermometer. Edgar Buckingham. Detailed discussion of the subject, with the conclusion that the auxiliary stem method is the best we have for work of high accuracy, as well as the most convenient. 9000 w. Bul Bureau of Stand—June 15, 1912. No. 38657 N.

The Sensitiveness of the Thermometer (Die Empfindlichkeit der Thermometer). Herr de Grahl. The derivation of formulae for determining the coefficient of sensitiveness. Diagrams. 3000 w. Feuerungstechnik—Jan. 15, 1913. No. 40024 D.

New Calorimetric Resistance Thermometers. H. C. Dickinson and E. F. Mueller. Illustrated general description of the latest form of these instruments. 2500 w. Bureau of Stand—No. 200. No. 44735 N.

See also Pyrometry, under *Measurement*.

Thermometry

Thermometric Lag. D. R. Harper, 3d. Methods of determining lag are discussed and experiments given to test the theories as applied to different thermometers. 12,500 w. Bul Bureau of Stand—March 1, 1913. No. 42929 N.

A Chart for Use in Connection with Wet and Dry Bulb Thermometers in Making Psychrometric Determinations. Clarence P. Linville. Gives the chart prepared by Willis H. Carrier, explaining its value and use. 900 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46354 F.

Time Keeping

Time Keeping by Machinery. Illustrated description of the system in use by the marine department of the Maryland Steel Co. 1500 w. Ir Trd Rev—Dec. 12, 1912. No. 38160.

Torsion

A New Relation in Torsion Loading. G. B. Upton. Explains a graphical relationship discovered between the torsion test of ductile metals and the direct spear test. 1200 w. Sib Jour of Engng—June, 1913. No. 43185 C.

Test of a Gary-Cummings Torsion Meter for the U. S. S. Duncan at the Works of the Fore River Shipbuilding Company. Warren G. Child. Describes the calibration test for the port shaft of the U. S. S. Duncan. Ills. 700 w. Jour

MEASUREMENT**Venturi Meter**

Am Soc of Nav Engrs—May, 1913. No. 42920 H.

Torsion Indicators (Ueber Torsionsindikatoren). Dr. Nettmann. A study, covering the theory and practice of methods and devices for measuring the torsion of rotating shafts. Ills. Serial, 1st part. 3000 w. Die Turbine—June 20, 1913. No. 43539 D.

Torsionmeter

A Torsionmeter with Visible Scale. Dr. K. Suyehiro. Abstract of a paper read before the Japanese Soc. of Naval Archts. Diagrams and description. 900 w. Engng—Oct. 3, 1913. No. 45860 A.

Toughness

The Property of Toughness in Metals. Albert F. Shore. Brief paper read before the Am Soc for Test Mat. Explains methods of determining toughness and the relation of bend and tension test readings. Ills. 900 w. Ir Age—July 3, 1913. No. 43450 C.

Trigonometry

The Use of Trigonometry in the Shop. Thomas R. Shaw. Shows how the solution of most triangles can be obtained and gives formulae. 1500 w. Mech Engr—Aug. 15, 1913. No. 44719 A.

Tube Stresses

Stress Analysis of Circular Tubes. Björgulf Haukelid. Analytical and graphical determination of stresses in tunnel sections under various conditions of loading. 2000 w. Eng Rec—June 14, 1913. No. 42830.

The Distribution of Deformation in Metals Subject to Pressure (Distribution des déformations dans les métaux soumis à des efforts). Ch. Frémont. A study of the folding effect produced on weighted tubes. Ills. 3000 w. Tech Mod—June 1, 1913. No. 43069 D.

The Distribution of Deformation in Metals Subjected to Pressure (Distribution des déformations dans les métaux soumis à des efforts). L. Hartmann. A discussion from views previously expressed by Ch. Frémont on folding effect in flexible metal tubes. Ills. 3500 w. Tech Mod—Aug. 1, 1913. No. 45335 D.

Units of Force

Recommendations Concerning the Units of Force. Edward V. Huntington. Discusses perplexities arising in connection with force, mass, and weight, and gives recommendations. 3500 w. Bul Soc for Pro of Engng Ed—June, 1913. No. 44828 N.

Venturi Meter

The Venturi Steam Meter. Charles G. Richardson. Illustrated explanation of the construction and operation of the venturi meter when used for measuring the

Viscometer

flow of steam through a steam pipe. 2000 w. Power—Oct. 7, 1913. No. 45698.

Viscometer

A New Viscometer. The Rhodin viscometer is illustrated and described, and explanation of the principle of measurement. 2200 w. Engr, Lond—June 13, 1913. No. 43151 A.

Weighing Machines

A New Automatic Weighing Machine. Illustrated description of the machine known as the Kron scale, the invention of William Simonsson. 1000 w. Engr, Lond—Jan. 10, 1913. No. 39273 A.

The Schenck Automatic Weighing Machine with Auxiliary Sliding Weight (Die

POWER AND TRANSMISSION**Belts**

selbststättige Brückenwage mit Hilfsaufgewicht, Bauart Schenck). E. Blau. Especially adapted as a track scale for weighing mine cars. Ills. 2000 w. Oest Zeit f B u H—Jan. 18, 1913. No. 40018 D.

See also Track Scales, under RAILWAY ENGINEERING, Permanent Way and Buildings.

Weights

The New International Diamond Carat of 200 Milligrams. George Frederick Kunz. Necessity for a uniform standard and the final adoption of this unit, with basis for determining values from old units. 10400 w. Bul Am Inst Min Engrs—July, 1913. No. 44014 F.

POWER AND TRANSMISSION**Air Compressors**

Air Compressors. George Barr. Read before the Manchester Assn. of Engrs. Discusses why compressed air is considered an inefficient means of power transmission and what has been done to better conditions. 2000 w. Mech Wld—Nov. 15, 1912. Serial. 1st part. No. 37818 A.

Measuring Air from Compressor. E. A. Fessenden. Gives a simple and accurate method of measuring air discharge from a compressor. 1200 w. Power—Dec. 31, 1912. No. 38702.

Electric Driven Air Compressors as Exemplified by Plants for Underground Work in New York City. Frank Richards. An account of the electrically driven air compressor plants for Lexington Ave. subway work, and other important underground work in New York City. Ills. 1500 w. Engng & Con—Jan. 22, 1913. No. 39327.

Rules for Test Methods on Compressors (Regeln für die Leistungsversuche an Kompressoren). Specifications adopted by the German Engineering Society. Ills. Serial. 1st part. 2500 w. Kälte-Ind—Dec., 1912. No. 39014 D.

Compressor for Charging Compressed-Air Mining Locomotives. Illustrated description of compressor plant and compressed-air locomotives, built in Berlin, for hauling in mines. 1200 w. Engng—Feb. 7, 1913. No. 39916 A.

The Air Compressor and the Electric Drive. Frank Richards. Illustrated description of the use of the electric driven compressor on the N. Y. subways. 1800 w. Compressed Air—March, 1913. No. 40431.

A Large English Air Compressor. Illustrates and describes a large capacity machine employing a new type of

valve. 800 w. Coal Age—Aug. 16, 1913. No. 44438.

Air Pump

Present Status of the Leblanc Air Pump. H. T. Herr. Illustrated description of the Leblanc system, its characteristics under favorable conditions, its application, etc. Ills. 2500 w. Jour Am Soc of Nav Engrs—Nov., 1912. No. 38297 H.

Bearings

Main Points in the Selection of Stuffing-Box Packing (Hauptgesichtspunkte in der Wahl von Stopfbüchsen-Packungen). H. Hirschlauff. Commercial types and the duties to be expected from them. Ills. 4000 w. Kälte Ind—July, 1913. No. 44673 D.

Belts

The Practicability of Steel Belting. R. K. Cronkhite. Gives results of tests under a variety of conditions. Ills. 1500 w. Am Mach—Nov. 21, 1912. No. 37665.

Heavy Belt Transmission for Rolling Mills (Ueber schwere Riemenantriebe für Walzwerksanlagen). W. Schömburg. A study of belt arrangements and sizes for this class of duties. Ills. 2400 w. Stahl u Eisen—Oct. 3, 1912. No. 37401 D.

Belting: Transmission of Power. R. Berry. Summary of a report to the Birmingham Assn. of Mech. Engrs. Considers material, care, size, etc., giving the merits and demerits of each method. 1700 w. Prac Engr—Dec. 5, 1912. Serial. 1st part. No. 38237 A.

Studies on Belt-Shifting Devices (Studio sui montacachingia installati). G. Capello. Describing various systems of belt-shifters and discussing their relative merits. Ills. Serial. 1st part. 2400 w. Industria—Nov. 17, 1912. No. 38495 D.

Consult Classification of the Index. See page 9.

Blower Design

The Theory of Belt Driving (Zur Theorie der Riementriebe). W. Maier. A consideration of the centrifugal elements derived from the belt motion. Diagrams. 4000 w. *Zeitschr des Ver deutscher Ing*—Dec. 21, 1912. No. 39039 D.

The Pulling Power of Slack Belts. Robert Thurston Kent. Describes investigations and reports results. 3000 w. *Ind Engng*—May, 1913. No. 41953 C.

The Protection of Main Belt Drives with Fire Retardant Partitions, with Observations on the Safeguarding of Vertical Openings Through Floors and the Relation of Such Protection to the Safety of Operations Employed in Manufacturing Establishments. C. H. Smith. Ills. 1500 w. *Jour Am Soc of Mech Engrs*—May, 1913. No. 42406 D.

Stretching and Axle Loads on Belt and Rope Drives (Vorspannung und Achsdruck bei Riemen- und Seiltrieben). Georg Duffing. A study of formulae on the sag of belts and ropes. Diagrams. 8000 w. *Zeit des Ver deutscher Ing*—June 21, 1913. No. 43532 D.

How Flexible Steel Belting is Manufactured. Illustrates and describes the special machines employed, the forming and assembling operations, tests of the belt and its application. 1500 w. *Ir Trd Rev*—Aug. 21, 1913. No. 44523.

Blower Designs

The Centrifugal Blower for High Pressures. Henry F. Schmidt's paper is discussed. Ills. 14500 w. *Jour Am Soc of Mech Engrs*—July, 1913. No. 44026 D.

Blowers

Blowers for Steel Works (Les machines soufflantes pour acières). H. Noble. A study of the operation of piston, steam, electric and turbo-blowers in steel manufacture. Ills. 5400 w. *Tech Mod*—April 15, 1913. No. 42174 D.

Memorandum on the Centrifugal Blower for Foundry Use. Dr. Richard Moldenke. Reviews an efficiency test made in Germany. Ills. 1000 w. *Am Found Assn*—Oct., 1913. No. 46270 N.

Central Plants

New York City's Power Problems. A. D. Blake. Illustrated discussion of a test now being conducted on the plant at the Hall of Records, extending over a year. 1500 w. *Power*—Aug. 26, 1913. No. 44583.

Chain Driving

Chain Driving. H. T. Hildage. Abstract of a paper read before the Rugby Engng Soc. States the advantages of chain gearing, and discusses characteristics of various types. Ills. 5000 w. *Mech Engr*—Nov. 29, 1912. No. 38123 A.

POWER AND TRANSMISSION**Compressed Air**

Transmission by Toothed Chains (Catene a denti per trasmissione). Allara Giacomo. Advocating the use of toothed pulleys and toothed flexible chains, and giving points in the design of such chains. Ills. 4200 w. *Monit Tec*—March 10, 1913. No. 40619 D.

Clutches

Characteristics of Friction Clutches. J. W. Brassington. Calls attention to the importance of the friction clutch and the lack of technical information covering the design. 1200 w. *Mach, N Y*—Aug., 1913. No. 44079 C.

Compressed Air

Measuring the Flow of Air in Pipes. G. G. Crewson. Illustrates and describes the apparatus used—a form of pitot tube. 700 w. *Compressed Air*—Dec., 1912. No. 38571.

The Resistance to the Flow of Air Through Pipes. A. H. Gibson. Gives a formula developed, with tabulated particulars of experiments examined. 500 w. *Engng*—Nov. 22, 1912. No. 38031 A.

A Graphic Solution of D'Arcy's Formula for the Transmission of Compressed Air in Pipes. Nathaniel Herz. Gives a graphic chart, explaining its use. 700 w. *Bul Am Inst of Min Engrs*—Dec., 1912. No. 38373 F.

Compressed Air—A Foundry Necessity. Arthur F. Murray. Outlines the uses to which compressed air is applied in the foundry, and briefly considers compressors, piping, and installation. 2500 w. *Am Found Assn*—Dec., 1912. No. 38610 N.

The Generation and Use of Compressed Air for Mining. George Blake Walker. Abstract of a paper read before the Midland Inst. of Min., Civ., & Mech. Engrs. Illustrates and describes devices used in air compression, typical machines of English builders, the utilization of compressed air, etc. 4200 w. *Col Guard*—Jan. 31, 1913. No. 39793 A.

Generation and Use of Compressed Air. George Blake Walker. Abstract of a paper read before the Midland Inst. of Min., Civ., & Mech. Engrs. Discusses types of compressors, the arrangement of the working parts, and related subjects. Ills. 2000 w. *Quarry*—March, 1913. Serial, 1st part. No. 40470 A.

Applications of Compressed Air in the Foundry (Einiges über die Verwendung der Pressluft in der Giesserei). Hubert Hermanns. Hand-ramming machines for molding work, riveters, chipping tools, etc. Ills. Serial, 1st part. 2800 w. *Giess Zeit*—Feb. 15, 1913. No. 40519 D.

Compressed Air for Working Auxiliaries in Ships Propelled by Internal-Com-

Compressed Air

POWER AND TRANSMISSION

Electric Drive

bustion Engines. W. Reavell. Read before the Inst. of Naval Archts. Shows the advantages of compressed air for this purpose and discusses the conditions under which it can be most efficiently used. 4000 w. Mech Engr—March 21, 1913. No. 41009 A.

The Measurement of Compressed Air Delivered by the Hydraulic Compressor, Cobalt. C. H. Taylor. Illustrates and describes types of testing apparatus, discussing tests made, and improvements introduced. 3000 w. Qr Bul of Can Min Inst—March, 1913. No. 41603 N.

Historical Development of Compressed Air Plants (Zur Entwicklungsgeschichte der Druckluftanlagen). A. Riedler. A review of the men and companies prominent in the development of compressed air power machinery. 5000 w. Zeit des Oest Ing u Arch Ver—March 7, 1913. No. 41472 D.

Entropy-Temperature and Transmission Diagrams for Air. C. R. Richards. Presents the theory and use of three graphical charts, by the aid of which all problems pertaining to the compression, expansion and transmission of compressed air may be solved. 20 pp. Bul Univ of Ill, No. 63—Jan. 6, 1913. No. 42479 N.

Time Studies and Air Consumption. Andre Formis. Presents studies of drilling operations and of pump performance. Ills. 1200 w. Eng & Min Jour—June 14, 1913. No. 42832.

Intercooling in Air Compression. R. S. Howard. A method of correcting compressor test data for comparison with guarantees. 2000 w. Ind Engng—June, 1913. No. 42696 C.

Some Novel Uses of Compressed Air. Illustrated account of how compressed air is used for sheep shearing, cutting sugar cane, shifting automobile gears, and other uses. 2500 w. Sci Am—July 5, 1913. No. 43427.

Air Compressors and Compressed Air Machinery. Robert L. Streeter. First of a series of illustrated articles. Discusses the economy of compression and uses for air tools. 4000 w. Engineering Magazine—Sept., 1913. No. 44765 B.

Air Compressors and Compressed-Air Machinery. Robert L. Streeter. This second article of a series considers small compressors, their classification and characteristics. Ills. 4000 w. Engineering Magazine—Oct., 1913. No. 45540 B.

Air Compressors and Compressed Air Machinery. Robert L. Streeter. This third article of a series deals with large steam-driven compressors. Ills. 3500 w. Engineering Magazine—Nov., 1913. No. 46302 B.

Leakage in Compressed Air Lines. William D. Ennis. Discusses practical methods of testing leakage in shop lines. 1800 w. Prac Engr, Chicago—Sept. 15, 1913. No. 45134.

Compressed Air in the Cotton Industry. C. C. Phelps. Explains its important part in the various stages of manufacture. Ills. 7000 w. Compressed Air—Oct., 1913. No. 46291.

Value of Exhaust Steam in Producing Compressed Air for Mines (Die Verwertung des Abdampfes zur Erzeugung komprimierte Luft für den Bergbau). M. A. Laponche. The use of the low-pressure stage compressors in this connection. Serial, 1st part. 2000 w. Turbine—Aug. 20, 1913. No. 46060 D.

See also same heading, under Civil Engineering, Construction, and Hoisting and Mine Power, under MINING AND METALLURGY, Mining. See also Pneumatic Tools, under Machine Works and Foundries.

Compressors

Specifications for Performance Tests of Ventilators and Compressors (Regeln für Leistungsversuche an Ventilatoren und Kompressoren). Discussion by several members of the Vereines deutscher Ingenieure on this subject. Ills. Serial. 1st part. 10000 w. Zeitschr des Ver deutscher Ing—Nov. 2, 1912. No. 38448 D.

See also Rotary Machines, under Machine Elements and Design.

Costs.

Cost of Producing Power Based on Iowa Coals, with a Comparison of Estimated Costs from Actual Tests. Data for estimating cost from a bulletin of the Iowa State College, originally presented by H. W. Wagner. 6000 w. Engng & Con—Feb. 19, 1913. No. 39933.

Economy

Economy: Hints for Power Users. F. R. Parsons. Calls attention to permissible economies. 1200 w. Prac Engr—May 8, 1913. No. 42066 A.

Electric Drive

Group and Individual Drives. A. G. Popcke. Analysis and comparison of individual motor-driven shop and engine-driven counter shafting. 3000 w. Am Mach—Dec. 19, 1912. No. 38263.

The Use of Motor Drives for Shops. A. G. Popcke. Discusses the advisability of using individual motor drives for machine tools, the sizes to be used for various purposes. 5500 w. Am Mach—Jan. 2, 1913. No. 38734.

Reversing Motors for Machine Tools. Charles Fair. A comparison of direct-connected reversing motor drive with belt and pneumatic drives. Ills. 3000 w. Am Mach—Jan. 16, 1913. No. 39125.

Electric Power

POWER AND TRANSMISSION

Lubrication

Electric Drive for Fans and Blowers. S. R. Stone. Explains the uses of electrically driven fans, blowers, compressors, etc., in metal working plants, and gives formulae for determining the size of motor required. 2000 w. *Am Mach*—March 13, 1913. No. 40423.

Economies in the Use of Electric Power. W. E. Milns. Abstract of a paper read before the Birmingham Sec. of the Inst. of Elec. Engrs. Discusses the importance of technical advice in arranging an electric drive. Gives information concerning the electrical energy used in various trades. 1800 w. *Elect'n, Lond*—March 14, 1913. No. 40808 A.

Electric Drives for Sheet Shearing, Straightening and Bending Machines (Der elektrische Antrieb von Blechscheren, Richt- und Biegemaschinen). Georg Heymann. Wiring plans, controls and machines for rolling mill work. Ills. 1500 w. *Stahl u Eisen*—Feb. 13, 1913. No. 40503 D.

Electric Drive in Machine Shops. Charles Fair. Discusses the advantages, increase in production and decrease cost. 2000 w. *Pro Am Inst of Elec Engrs*—Oct., 1913. No. 46339 F.

Electric Power

Electricity in Machine Shops. Discusses some of the advantages and gives comparative costs on group and individual drive. Ills. 2500 w. *Elec Rev & W Elect'n*—March 29, 1913. No. 40949.

Cutting the Cost of Power for the Factory. Stuart Dean. Discusses the economies effected by judicious selection and use of electric motors or other equipment. 1800 w. *Ir Age*—April 17, 1913. No. 41273 C.

Electrically-Driven Planing Machine. Illustrations with brief descriptions. 500 w. *Engng*—Jan. 24, 1913. No. 39798 A.

Considerations When Applying Motor Drives. A. G. Popcke. Illustrates and describes examples of applications to machine tools. 1500 w. *Am Mach*—Feb. 27, 1913. No. 40142.

Gas Power

Recent Development of Gas Power in Europe. H. J. Freyn. Discusses the Diesel engines, gas turbines, gas cleaning methods, coke oven gas, etc.; also discussion. 7000 w. *Jour Am Soc of Mech Engrs*—Feb., 1913. No. 40150 D.

Lubricants

The Chemistry of Cylinder Oils. W. Jones. Gives facts based on chemical analysis. 1600 w. *Automobile*—Oct. 31, 1912. Serial. 1st part. No. 37204.

The Economic Use of Lubricating Oils. David A. Corey. Abstract of a paper read before the Nat. Assn. of Cotton Mfrs. Considers the selection of oils,

leakage, re-use of oil, losses, oiling systems, etc. 3000 w. *Ind Engng*—Nov., 1912. No. 37334.

Purchase of Lubricating Oil by Specification. A. D. Smith. Discusses the difficulties, methods of testing, and related matters. General discussion. 16000 w. *Pro Engrs' Soc of W Penn*—Nov., 1912. No. 38398 D.

Apparatus for the Examination and Study of the Behavior of Valve and Cylinder Oils and Other Petroleum Lubricating Oils in Saturated and Superheated Steam, Carbon Dioxide, Air and Other Gases. P. H. Conradson. Illustrated description with table of comparative tests. 1200 w. *Chem Engr*—Nov., 1912. No. 37920 C.

Lubricating Oil. Harry Tipper. Remarks on the efficiency and use, considering the usual methods of determining the lubricating qualities, and their failure to satisfy requirements. 4500 w. *S A E Bul*—April, 1913. No. 42340 N.

Specifications for Lubricating Oil A. D. Smith. Considers some of the difficulties encountered in drawing specifications to insure satisfactory lubrication. 3000 w. *Col Engr*—July, 1913. No. 43408 C.

The Lubricating Value of Cup Greases. A. L. Westcott. (Abstract.) Report of investigations made to test a number of greases under a variety of conditions as to bearing pressure, temperature, and method of application, for coefficient of friction and general suitability as a lubricant. Ills. 3500 w. *Jour Am Soc of Mech Engrs*—July, 1913. No. 44027 D.

The Ossag Machine for Testing Oils (Machine Ossag à essayer les huiles). M. Gérard. Description of a recording instrument for testing lubricating oils. Ills. 3600 w. *Rev Industrielle*—June 21, 1913. No. 43585 D.

See also Fuels, under *Combustion Motors*, and Locomotive Lubricants, under *RAILWAY ENGINEERING, Motive Power and Equipment*.

Lubrication

The Economic Use of Lubricating Oils. David A. Corey. Abstract of a paper read before the Nat. Assn. of Cotton Mfrs., New London, Conn. Discusses oil handling and lubrication. 2500 w. *Mech Engr*—Dec. 27, 1912. No. 38884 A.

Engine-Cylinder Lubrication. Willis Lawrence. Discusses lubricants, favoring graphite combined with oil. 2000 w. *Power*—June 10, 1913. No. 42736.

Lubrication at Steptoe Concentrator. A. G. Marsh. Describes a system that resulted in a saving of 20 per cent in lubricant cost. 1800 w. *Eng & Min Jour*—June 21, 1913. No. 43107.

Mill Power

POWER AND TRANSMISSION

Power Plants

See also same heading, under *Combustion Motors*, and *Machine Tools*, under *Machine Works and Foundries*.

Mill Power

Driving Textile Mills by Gas. From a paper by Sydney F. Walter, in the *Gas World*. Considers the conditions for driving textile mills and the advantages of the electric drive and gas engine drive. Line drawings. 3000 w. *Am Gas Lgt Jour*—Aug. 25, 1913. No. 44582.

Motive Power

The Choice of Motive Power (Die Wahl einer Betriebskraft). Friedrich Barth. Comparison of power supplies, per cost per horsepower. Diagrams. Serial. 1st part. 3800 w. *Zeitschr des Ver deutscher Ing*—Oct. 5, 1912. No. 37446 D.

The Choice of Motive Power (Die Wahl der Betriebskraft). G. Klingenberg. A discussion on previous paper by Fr. Barth, pointing out some errors in calculation; and a reply by Herr Barth. Diagrams. 7700 w. *Zeitschr des Ver deutscher Ing*—March 15, 1913. No. 41460 D.

Motor Drive

Motor Drive for Machine Tools. F. E. Hanchette. A discussion of speed control. 3000 w. *Elec Rev & W Elect'n*—June 21, 1913. No. 43121.

Natural Powers

Harnessing Nature. Waldemar Kaempfert. Discusses the possibilities of engineering when combustibles will no longer be available. 4500 w. *Sci Am*—April 5, 1913. No. 41039.

Packing

Pressure Tests with Vulcanized Fiber, Ebonite and Metal for Stuffing-Box Packing (Druckversuche mit Vulkanfaser, Hartgummi und Metall für Stopfbüchsenpackungen). R. Baumann. Description of tests and their results. Ills. 1700 w. *Zeit des Ver deutscher Ing*—June 7, 1913. No. 43527 D.

Power Costs

Power Costs in a Manufacturing Plant. H. J. Miste. Explains how the economy of a new plant was increased and describes the system of records kept. 2500 w. *Power*—Dec. 3, 1912. No. 38017.

Comparative Cost of Gas and Steam Plants. L. B. Lent. Gives relative cost of producing electric power in a small lighting plant near New York City. 1200 w. *Power*—Sept. 9, 1913. No. 45015.

Power Plants

Power Plant of the Charlton Mills. Warren O. Rogers. Illustrated description of a plant at Fall River, Mass., having six 250-h. p. return-tubular boilers

with dutch-oven furnaces, and some unusual features. 1000 w. *Power*—Nov. 26, 1912. No. 37783.

Power Plant Economics. Horace W. Flashman. Discusses particularly the development of an operating schedule appropriate to the working apparatus. 5000 w. *Sch of Mines Qr*—Nov., 1912. Serial. 1st part. No. 38557 D.

Combining Steam and Gas Power. Illustrates and describes the Mesta Machine Co.'s power plant and its methods, calling attention to the important economies effected. 2000 w. *Ir Age*—Jan. 2, 1913. No. 38755 C.

The Prudential Insurance Co. Plant. Charles H. Bromley. Illustrated description of the power equipment for a great group of office buildings. 2500 w. *Power*—Jan. 7, 1913. No. 38840.

Critical Study of a 100-H. P. Power Plant to Use Waste Wood in Large Quantities (Étude critique d'une installation de force motrice de 100 chevaux dans une usine disposant de déchets de bois en grande quantité). R. E. Mathot. Study of the most economical engine adaptable to such fuel. Ills. 4000 w. *Tech Mod*—Dec. 15, 1912. No. 39071 D.

Cost of Constructing a Turbo-Generator Power Plant, Transmission Line, and Substructures. From an article by James W. Malcolmson, in *Western Engng*. Gives description and cost data concerning a plant at Douglas, Ariz., supplying power for mines in Mexico, 65 miles distant. 1500 w. *Engng & Con*—March 12, 1913. No. 40453.

The Power House at the New Keokuk Dam. M. F. McFarland. Illustrated detailed description of the power house at Keokuk, Iowa, and its equipment. 2200 w. *Wis Engr*—Jan., 1913. No. 40846 C.

The Design of Steam Power Plants. Earl F. Scott. First of a series of articles discussing details of design of small steam plants. 4000 w. *Elec Engng*—April, 1913. Serial. 1st part. No. 41327.

Central Power Plant of Montgomery, Ala. Warren O. Rogers. The main features are the manner of coal delivery, piping of the generating and auxiliary units, and the design of the pump-house. Ills. 1200 w. *Power*—April 1, 1913. No. 40964.

The Power Plants of the Southern Indiana Power Company. De Witt V. Moore. Describes a hydroelectric power plant having a steam auxiliary plant as a reserve in times of extreme low or high water. 3000 w. *Indiana Engng Soc*—1912. No. 41743 N.

The Power Plants of Textile Mills.

Consult Classification of the Index. See page 9.

Power Plants

John A. Stevens. Presents some of the points to be considered in providing a power plant which shall do its best work in such mills. Ills. 7800 w. Jour Am Soc of Mech Engrs—Dec., 1912. No. 38507 D.

The Power Plants of Textile Mills. Discussion of John A. Stevens' paper. 1600 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41300 D.

The Design of Steam Power Plants. Earl F. Scott. Gives an analysis of conditions determining selection of plant equipment. 4000 w. Elec. Engng—May, 1913. No. 41951.

New Power Plant at Weber Wagon Works. A. R. Maujer. Illustrated description of a plant containing two 750-kw. bleeder-type turbines and water-tube boilers with Dutch-oven furnaces, using a combination of wood refuse and coal as fuel. 2500 w. Power—May 27, 1913. No. 42396.

Power Plant of Woolworth Building. Thomas Wilson. Brief Illustrated description of the boiler plant and auxiliaries, electrical installation, elevator equipment, heating and ventilating apparatus. 3000 w. Power—June 24, 1913. No. 43122.

Power Plant of the Madison Avenue Building. Thomas Wilson. Illustrated description of a small non-condensing office building plant. 1200 w. Power—July 1, 1913. No. 43320.

Power Plant of the Otis Building. A. R. Maujer. Illustrates and describes a carefully designed plant for a Chicago 16-story building. 4000 w. Power—July 8, 1913. No. 43490.

Power-Plant Vibration and Methods of Isolation. Francis H. Davies. Discusses the nature of vibration and its transmission through soils of varied character, and different kinds of isolating material to absorb vibration. 2500 w. Power—Aug. 12, 1913. No. 44297.

Features of the Lemp Brewing Company's Plant. Illustrated description of a plant in St. Louis which furnishes light, power, heat and refrigeration for a large brewery. 2000 w. Power—Sept. 23, 1913. No. 45273.

Efficient Power Plant Operation. Ernest Cordeal. Calls attention to losses due to machinery in need of repair and pipe lines improperly maintained. 3800 w. Ry Age Gaz (Mech Ed)—Oct., 1913. No. 45666 C.

Iroquois Iron Co. Plant. Review of the process employed and illustrated description of a Chicago plant which burns by-product gas in boilers supplying steam to a complete turbine installation. 1800 w.

POWER AND TRANSMISSION

Prac Engr, Chicago—Oct. 1, 1913. No. 45576.

See also Water Power, under CIVIL ENGINEERING, *Water Supply*.

Power-Plant Testing

Rules for Conducting Performance Tests of Power Plant Apparatus. Preliminary report of power test committee, codes of 1912. Ills. 42800 w. Jour Am Soc of Mech Engrs—Nov., 1912. No. 37879 D.

Power Resources

Sources of Energy Available for Power. Abstract of the presidential address by Dr. H. S. Hele-Shaw to the Assn. of Engrs.-in-charge. Deals particularly with the coal supply, mineral oils, water and wind power, and heat derived from the earth. 3000 w. Elect'n Lond—Oct. 25, 1912. No. 37288 A.

The Sources of Energy Available to Man. J. A. Fleming. Calls attention to possible supplies not yet appropriated. 4000 w. Sci Am Sup—Nov. 30, 1912. No. 37975.

See also Motive Power, under *Power and Transmission*.

Power Tests

Test Methods for Comparing Steam Engines and Gas or Combustion Motors (Méthodes d'essais comparés des machines à vapeur et des moteurs à gaz ou à combustion). Leon Letombe. Methods for determining the mechanical and thermal output. Ills. 6000 w. Tech Mod (Supplement)—March 15, 1913. No. 40606 D.

Prime Movers

The James Watt Lecture. S. Z. de Ferranti. An account of the great difficulties James Watt had to overcome in order to bring about the utilization of his inventions, and a discussion of the recent developments in prime movers. (Abstract.) 2500 w. Engr, Lond—Jan. 24, 1913. No. 39810 A.

Pulleys

Table for Cone Pulley Diameters. J. H. O'Brien. Gives a table covering a wide range of conditions, explaining its use. 1800 w. Am Mach—Nov. 28, 1912. No. 37834.

Split vs. Solid Pulleys. H. A. Jahnke. Explains advantages of split pulleys and where they are useful. 1000 w. Power—Nov. 5, 1912. No. 37273.

Tests of Wood, Paper and Steel Pulleys. H. A. Woodworth. Illustrated account of tests made to determine the breaking strength of pulleys of different kinds. 2500 w. Power—Dec. 10, 1912. No. 38100.

Crown Face Pulleys. George N. Van Derhoef. Review of the practice in pulley crowning and suggestions for obtaining

Rope Cables

the best results. 2500 w. Mach, N Y—April, 1913. No. 40981 C.

Diagrammatic Study of Stepped-Pulley Drive (Zeichnerische Ermittlung von Stufenrädertrieben). Rudolf Langner. Diagrams and their explanation. 4000 w. Zeit des Ver deutscher Ing—Sept. 27, 1913. No. 46044 D.

See Headgears, under MINING AND METALLURGY, Mining.

Rope Cables

Transmission by Rope Cables (Transmission par câbles en chanvre). F. Moquet. Mathematical calculations on the transmitting of power. Diagrams. 3000 w. All Indus—Oct., 1912. No. 37525 D.

Rope Driving

Efficiency of Rope Driving as a Means of Power Transmission. E. H. Ahara. Deals with a series of tests on transmission of power by rope drives under various conditions. Ills. 3500 w. Jour Am Soc of Mech Engrs—Aug., 1913. No. 44512 D.

Shafting Losses

Factory Shafting Losses. J. T. Towlson. Discusses the importance of suitably aligning and leveling long lines of shafting and the construction and advantages of roller bearings. 1500 w. Prac Engr—Jan. 16, 1913. No. 39386 A.

See also Stresses, under Measurement.

Shafts

Alignment of Shafting. Reviews an address by Mr. Loggie calling attention to the loss of power that can be charged to line shafting, and describing a device for levelling and aligning shafting. 2200 w. Prac Engr—Nov. 7, 1912. No. 37622 A.

Critical Speeds of Shafting. A mathematical study. 700 w. Mech Wld—June 13, 1913. No. 43140 A.

Shaft Supports

Intermediate Supports for Long Shafts. W. G. Dunkley. Discusses considerations governing the practical methods of design. 1200 w. Mach, N Y—Jan., 1913. No. 38724 C.

Shop Plant

Power Plant for Railroad Locomotive Shop. Illustrates and describes interesting features in the power plant of the main locomotive shops of the C. & N.-W. R. R. 2200 w. Prac Engr, Chicago—Sept. 1, 1913. No. 44861.

Tidal Power

Derivation of Power from Tidal Waters. C. A. Battiscombe. Discusses the difficulties to be surmounted in utilizing the tidal stream for power purposes. 2000 w. Nature—Aug. 28, 1913. No. 45023 A.

Turbo-Blowers

The Centrifugal Blower for High Pres-

POWER AND TRANSMISSION

ures. Henry F. Schmidt. Gives the essential elements of blower design in convenient form for reference. Discusses efficiencies and characteristics of types. 5800 w. Jour Am Soc of Mech Engrs—Nov., 1912. No. 37878 D.

Turbo-Compressors

Experiments on a Turbo-Compressor at the Westerholt Mines (Untersuchung eines Turbokompressors auf der Zeche Westerholt). Description of machine and layout, and results of tests. Ills. 2100 w. Glückauf—Nov. 23, 1912. No. 38420 D.

Vacuum Apparatus

Care of High Vacuum Apparatus. Suggestions on detecting and preventing leaks, use of thermometers to show operating defects, and the use of chemicals to detect contamination in water. 1800 w. Power—Dec. 31, 1912. No. 38703.

Water Power

Water Power and Water Supply Preliminaries. Robert E. Horton. Read before the Mich. Engng. Soc. Considers some common causes of failure, flow of streams, storage, etc. 2500 w. Eng Rec—Jan. 18, 1913. No. 39193.

Instructions Respecting Water Powers. A. V. White. Information from a pamphlet prepared as a guide in the collection of data relating to inland waters. 3000 w. Ap Sci—Dec., 1912. No. 39309 C.

Water Power from the Mississippi. G. Donald Bell. Illustrated description of a large hydroelectric development at the foot of the Des Moines rapids in the Mississippi. 2200 w. Can Engr—Jan. 23, 1913. No. 39406.

A Review of Water Power Development in the South During 1912. J. A. Switzer. Also editorial. 13000 w. So Elect'n—Jan., 1913. No. 39213.

Harnessing the Public Water Power. C. J. Blanchard. Reviews progress in the development of natural resources. Ills. 2500 w. Sci Am—April 5, 1913. No. 41040.

The Development of Water Power in the United States. Peyton R. Anness. Discussion of possibilities, tendencies, and problems. Ills. 2500 w. Yale Sci M—April, 1913. No. 41580 C.

Latent Power in the Streams of the South. Reviews the resources of power in southern streams, giving information concerning their present development. 1500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41556 N.

Columbia River Power Project Near the Dalles, Oregon. L. F. Harza. A description of the general engineering features of this large project, discussing possible power applications. Ills. 4500 w.

Water Power

Consult Classification of the Index. See page 9.

Water Power

Jour Assn of Engng Soc—April, 1913. No. 41289 C.

Brunet Falls Water Power and Paper-Mill Development on the Chippewa River. Illustrated description of a combined hydroelectric and industrial project at Cornell, Wis., to be converted eventually into a station generating electrical energy only. 4000 w. Eng Rec—April 5, 1913. No. 41115.

The Augst-Wyhlen Water Power Plant (Die Wasserkraftanlage Augst-Wyhlen). General description of plant developing power on both Swiss and German banks of the Rhine. This first number, including details of dam design, by G. Hunziker-Habich, other details to follow in later issues by other writers. Ills. Serial, 1st part. 2500 w. Schweiz Bau—March 29, 1913. No. 41443 D.

Supreme Court Decision on Water Power in St. Mary's River. 2500 w. Eng Rec—June 21, 1913. No. 43113.

Procedure in the Investigation in the Most Economical and Advantageous Use of Water, Storage Capacity and Tempera-

STEAM ENGINEERING**Boiler Economy**

ture for Water Power Plants (Verfahren zur Ermittlung der wirtschaftlich günstigsten Wassernutzung, Staubecken-grösse und Wärmekrafthilfe für Wasserkraftwerke). Dr. Leiner. The preparation and study of daily and monthly charts. Serial, 1st part. 2000 w. Zeit f d ges Turbinenwesen—May 20, 1913. No. 43036 D.

An Overestimated Value. Reginald Pelham Bolton. Discusses misunderstandings as to the actual capacity, adaptation and worth of water power as compared with steam power. Ills. 2500 w. Cassier's—July, 1913. No. 43354.

The Water Power Plant at Cismon near the Ponte della Serra (Das Wasserkraftwerk am Cismon bei Ponte della Serra). A. Forti. Details of the construction of the masonry dam, 100 ft. high, log chutes, etc. Ills. Serial, 1st part. 1500 w. Schweiz Bau—June 21, 1913. No. 43522 D.

See also Hydroelectric, under ELECTRICAL ENGINEERING, *Generating Stations*.

STEAM ENGINEERING**Accumulators**

Theory of Steam Accumulators and Regenerative Processes. F. G. Gasche. An analysis of the action of various forms of regenerators or accumulators. Mathematical. Ills. 17700 w. Pro Engrs Soc of W Penn—Dec., 1912. No. 39939 D.

Auxiliary Units

Development in Auxiliary Units Between Exhaust Pipe and Boiler. William Weir. States the principles involved and considers their practical embodiment in various forms of apparatus, with some typical results of performance. Ills. 8500 w. Trans Inst of Engrs & Shipbldrs in Scotland—Oct. 22, 1912. No. 38286 N.

Development in Auxiliary Units Between Exhaust Pipe and Boiler. Discussion of William Weir's paper on this subject. Ills. 1100 w. Trans Inst of Engrs & Shipbldrs in Scotland—Oct. 22, 1912. No. 39552 N.

New Auxiliary Steam Plant of W. E. R. Co. E. A. Graham. Illustrated description of the steam turbine plant of the Winnipeg Electric Ry. Co. 4000 w. Can Elec News—Jan. 1, 1913. No. 38796 C.

Boiler Cleaning

Report on the Conditions of Work in Cleaning Steam Boilers and Flues. J. H. Warren. From the 1912 report of the Chief Inspector of Factories and Workshops. 1800 w. Mech Engr—July 4, 1913. No. 43712 A.

Boiler Construction

Recent Efforts in Boiler Construction (Neuere Bestrebungen im Dampfkesselbau). Friedrich Münzinger. Some of the improvements put forth by the leading German firms. Ills. Serial, 1st part. 5500 w. Zeitschr des Ver deutscher Ing—Oct. 26, 1912. No. 37450 D.

Boiler Corrosion

Corrosion in Steam Boilers (Des Corrosions dans les Chaudières à Vapeur). La Maestra. Calculations and studies on the progress of corrosion. 7000 w. Tech Mod—Nov. 15, 1912. No. 37513 D.

See also Fuel Oil, under *Steam Engineering*.

Boiler Design

Calculations for a Boiler With Corrugated Side Flues (Calcul d'une chaudière à tube foyer ondulé latéral). Ed. Kaschny. Mathematical calculations for design. Ills. 6000 w. All Indus—Nov., 1912. No. 37528 D.

Modern Tendencies in Boiler Construction (Neuere Bestrebungen im Dampfkesselbau). Friedrich Münzinger. Describes some recent types of steeply-inclined multitubular boilers, and others. Ills. 2000 w. Zeitschr des Ver deutscher Ing—Dec. 21, 1912. No. 39038 D.

Boiler Economy

Boiler Plant Reorganization (Kesselhaus-Reorganisation). Richard Kabitz. An account of economies effected by in-

Consult Classification of the Index. See page 9.

Boiler Efficiency

stalling improved machinery and changing plant methods. Ills. 3500 w. *Zeitschr des Ver deutscher Ing*—Oct. 26, 1912. No. 37453 D.

Boiler Efficiency

Increasing Steam Plant Efficiencies. Edward Ingham. Considers ways in which it is possible to increase the efficiency of boilers. 3500 w. *Elec, Rev, Lond*—Jan. 3, 1913. No. 39135 A.

Boiler-Efficiency Chart. John C. Parker. Gives chart and explanation of its use. 500 w. *Power*—June 10, 1913. No. 42732.

Steam Boiler Efficiency and the Most Economical Method for Absorbing Heat from Gases of Combustion. Discusses methods of reducing the cost of steam. 1500 w. *Boiler Maker*—Oct., 1913. No. 45770.

Boiler Failures

The Explosion of One of the Boilers on Board the Steamship "Gutenberg" (De ontplofing van één der stoomketels aan boord van de stoomboot "Gutenberg"). Describes the failure, gives analysis of the steel shell, and discusses probable causes, contributing to the failure. Ills. 3900 w. *De Ingenieur*—Sept. 28, 1912. No. 37478 D.

Boiler Houses

Boiler House Layouts for Foundries (Kesselhausanlagen auf Hüttenwerken). Schömburg-Witten. Boiler designs and layout plans. Ills. Serial. 1st part. 2700 w. *Die Turbine*—Feb. 5, 1913. No. 40558 D.

The Erection of the Structural Steel for a Large Boiler House. Alder W. Welch. Gives a digest of the specifications. 2500 w. *Engng & Con*—Sept. 10, 1913. No. 45060.

Boiler Inspection

Boiler Inspection. Garland P. Robinson. From an address before the Richmond Ry. Club. Reviews the history of boiler inspection in the United States, the laws passed, and explosions and their causes. Ills. 3500 w. *Boiler Maker*—Sept., 1913. No. 45214.

See same heading, under RAILWAY ENGINEERING, *Motive Power and Equipment*.

Boiler Joints

Stresses in Unsymmetrical Boiler Joints. Abstract of a paper by S. H. Banaclough and A. J. Gibson. Account of an experimental investigation. 3300 w. *Power*—April 15, 1913. No. 41206.

Tension Due to Bending Stresses in Lap-Riveted Boiler Joints (Die Biegungsspannungen in überlappenden Kesselnietnähten). E. Daiber. Precise experiments with mathematical and graphical studies

STEAM ENGINEERING**Boilers**

of the stresses induced. Ills. 4700 w. *Zeit des Ver deutscher Ing*—March 15, 1913. No. 41457 D.

Boiler Losses

The Analysis of Boiler Losses. John G. Moxey. Shows how to determine the heat distribution. 1800 w. *Power*—Aug. 12, 1913. No. 44293.

Chimney Losses (Die Kaminverluste). Herr Maercks. An examination of the waste heat in boiler operation, by mathematical computations. Serial, 1st part. 2500 w. *Feuerungs*—Aug. 15, 1913. No. 44679 D.

Boiler Management

Advances in the Science of Regulation and Measurement in Boiler Heating Plants (Fortschritte auf dem Gebiete der Regelung und Messung in Feuerungs- und Heizanlagen). Otto Sprenger. Describes recent regulating valves and steam indicators. Ills. 3200 w. *Feuerungs*—Feb. 15, 1913. No. 40562 D.

Boiler Piping

Safe Piping for Boiler Plants. David Moffatt Myers. Illustrated description of a typical layout. 1400 w. *Power*—Dec. 10, 1912. No. 38102.

Boiler Plate

The Thickness of Boiler Sheets. Describes how boiler sheets vary in thickness and discusses the effect on the strength of the boiler. 1500 w. *Boiler Maker*—Oct., 1913. No. 45768.

Thirty Boiler Plates with Form of Fracture (Dreissig Kesselbleche mit Rissbildung). R. Baumann. Illustrating and defining ordinary causes of failure. 4900 w. *Stahl u Eisen*—Sept. 18, 1913. No. 46002 D.

Boiler Rules

The Board of Boiler Rules and Its Work. H. A. Baumhart. Explains conditions that led to the enactment of a boiler inspection law, and the rules formulated by the Ohio Board of Boiler Rules. 4800 w. *Jour Cleveland Engng Soc*—May, 1913. No. 42430 D.

Board of Trade Rules for Boilers and Machinery. Fairfax. Points out the more important modifications and additions which have been made. 1500 w. *Mech Wld*—Oct. 3, 1913. Serial, 1st part. No. 45854 A.

The Necessity for a Uniform Boiler Construction Law Rather Than for a Uniform Boiler Inspection Law. A. V. Cannon. Read before the Am Boiler Mfrs. Assn. Discusses laws of various states and gives the author's recommendations. 3500 w. *Boiler Maker*—Oct., 1913. No. 45764.

Boilers

Recent Boiler Construction for Steam Turbine Power Plants With Especial At-

Consult Classification of the Index. See page 9.

Boilers

STEAM ENGINEERING

Boilers

tention to Vertical Tubes (Neuere Dampfkesselkonstruktionen für Dampfmaschinen-kraftwerke unter besonderer Berücksichtigung der Steilrohrkessel). Fried. Münzinger. Reviews the requirements of such constructions and cites modern tendencies. Ills. Serial. 1st part. 2800 w. Zeit f d ges Turbinenwesen—Oct. 30, 1912. No. 37461 D.

Modern Boiler Problems. Col. E. D. Meier. Lecture before the Stevens Engng. Soc. Discusses the fitness of the water-tube boiler for modern conditions, the materials for its construction, and related matters. 5000 w. Stevens Ind—Oct., 1912. No. 38220 D.

The Steam Boiler. W. M. Francis. Read before the Prac. Refrig. Engrs. Assn. Discusses how to prepare boilers for inspection, and the care needed. 3000 w. Ice & Refrig—Jan., 1913. No. 38914 C.

Installation, Care and Management of Steam Boilers. Norman Register. Read before the Prac. Refrig. Engrs. Assn. Discusses points necessary to obtain the best results. 3500 w. Ice & Refrig—Jan., 1913. No. 38913 C.

Heat Balance in Steam Boilers. Lionel S. Marks. Develops a comparatively simple method of calculating heat balance from the results of a complete test. 3000 w. Power—Jan. 14, 1913. No. 39120.

The Operation of Low Pressure Heating Boilers. Instructions for the operation of such a system. 1800 w. Locomotive—Jan., 1913. No. 39503.

A Dust-Fuel Boiler and Its Uses. Hugh V. Hart-Davis. Illustrated description of the Bettington boiler and its operation, showing that it efficiently consumes coal-dust. Discussion. Plate. 6500 w. Trans Manchester Geol & Min Soc—Feb. 13, 1912. No. 39564 N.

The Niclausse Boiler (Les Chaudières Niclausse). A. Varlin. Principle characteristics of this type of water-tube boiler for marine purposes. Ills. 2400 w. Rev Industrielle—Jan. 11, 1913. No. 39076 D.

American Boiler Practice. A letter from F. W. Dean, giving illustrated description and information concerning horizontal return-tube boilers, and also a Scotch boiler and vertical fire-tube boiler. 3000 w. Engng—Feb. 7, 1913. No. 39920 A.

Horizontal Baffles in Water Tube Boilers. Albert A. Cary. Discusses different ways of baffling water tube boilers, the objections to each, and conclusions from experiments as to how and where baffles can best be used. Ills. 2000 w. Power—March 11, 1913. No. 40383.

Arrangement of Boilers on Board

Ship. J. Carson. States the problem assumed and explains its solution. 2000 w. Boiler Maker—May, 1913. No. 42013.

Boiler Inspection and Operation. Frank McManamy. Discusses the requirements of the Locomotive Boiler Inspection Law. General discussion. 11000 w. Pro W Ry Club—April 15, 1913. No. 42401 C.

Boiler Troubles, Their Causes and Their Prevention. Albert N. Dunlap. Read before the Nat. Assn. of Steam Engrs. Discusses scale and corrosion, and preventive methods. 3000 w. Ind Wld—May 5, 1913. No. 41839.

Scale, Pitting and Corrosion in Steam Boilers; Their Cause, Effect and Remedy. Discusses water-softening, describing a very simple apparatus, and considers various reagents for treating water in the boiler. 3500 w. Ir & Coal Trds Rev—May 9, 1913. No. 42297 A.

Master Boiler Makers' Association. Abstracts of addresses, reports, and discussions. 3500 w. Ry Age Gaz (Mech Ed)—June, 1913. No. 42682 C.

Performance of a 450-H. P. Boiler with Oil Fuel. A. L. Menzin. A report of tests made at Mare Island Navy Yard. Ills. 1500 w. Eng News—May 29, 1913. No. 42564.

The Yarrow Boiler. A report of tests made on one of the boilers constructed for the Chilean battleship *Almirante Latorre*. Ills. 1500 w. Engng—May 16, 1913. No. 42540 A.

Central Heating Boilers for Lignite Briquettes (Zentralheizungskessel für Braunkohlenbriketts). Herr Weilandt. Typical examples for using this particular fuel. Ills. Serial. 1st part. 2200 w. Feuerungs—June 1, 1913. No. 43033 D.

Construction of Underfired Boilers. W. E. Pinnegar. Suggestions for the design and construction of such boilers. Ills. 1800 w. Boiler Maker—July, 1913. No. 43728.

The Repair and Manufacture of Steam Boilers by Autogenous Welding. Henry Cave. Urges the necessity of placing restrictions on this work that dangers may be avoided. 1200 w. Boiler Maker—Aug., 1913. No. 44282.

Refractories for the Modern Boiler Plant. Kenneth Seaver. Considers the conditions to be met by fire brick in actual service, the material and structural details. Discussion. Ills. 7000 w. Pro Engrs' Soc of W Penn—July, 1913. No. 44517 D.

The 1913 Board of Trade Regulations for Steam Boilers. Compares the new with the previous regulations. 2500 w.

Consult Classification of the Index. See page 9.

Boilers

Mech Engr—Aug. 8, 1913. No. 44453 A.

The Determination of Heat Balance (Zur Aufstellung von Wärmebilanzen). W. Hassenstein. An explanation of the methods in use in various countries. Serial, 1st part. 3700 w. Feuerungs—July 1, 1913. No. 44675 D.

Boiler Attachments. J. E. Terman. Considers the proper location of the water column and gage glass on various types of steam boilers, and of piping and fittings to use in the connections. Ills. 3500 w. Power—Sept. 30, 1913. Serial, 1st part. No. 45513.

Boiler Furnace Efficiency. William M. Faber. Discusses the design and management of such furnaces. General discussion. 5000 w. Jour Cleveland Engng Soc—Sept., 1913. No. 45431 D.

Distribution of Heat in Steam Boilers. Perry Barker. Read before the Am. Inst. of Chem. Engrs. A study of losses in the steam boiler and some test results, showing how the boiler efficiency was increased. 1500 w. Power—Sept. 16, 1913. No. 45129.

Space Occupied by Water Tube Boilers. C. R. D. Meier. A study of the question of floor space for boilers. Line drawings. Also discussion. 3500 w. Jour Assn of Engng Soc—Sept., 1913. No. 45459 C.

The Distribution of Heat in the Operation of Steam Boilers. Perry Barker. Read before the Am. Inst. of Chem Engrs. A study of the controllable losses. 2500 w. Sci Am Sup—Oct. 4, 1913. No. 45615.

Securing Efficient Results in the Manufacture of Boilers. Delbert E. Merrifield. Discusses causes of inefficiency in boiler shops, the investigations and changes in management that resulted in marked improvement. 5500 w. Boiler Maker—Oct., 1913. Serial, 1st part. No. 45766.

Waste Heat Boilers in Reverberatory Furnace Flues. S. Severen Sorensen. A comparison of results between Stirling and the Babcock & Wilcox boilers when used to recover heat from the flue gases of metallurgical smelting furnaces. Ills. 900 w. Min & Sci Pr—Oct. 11, 1913. No. 45908.

Boiler Plant of American Sugar Co. Ernest F. Learned. Illustrated description of this plant at South Boston, Mass. 1500 w. Power—Oct. 14, 1913. No. 45813.

A Water-tube Boiler for Pulverized Coal. Sectional elevation, cross section, and description of the Bettington water-tube boilers using atomized fuel for steam generation. 1200 w. Ir Age—Oct. 2, 1912. No. 45598 C.

STEAM ENGINEERING

Combustion

Vertical Tubular Boilers (Steilrohrkessel). F. Fetzner. Requires small space, has one or more superior and inferior boilers connected by vertical or slightly inclined tubes. Ills. Serial, 1st part. 2700 w. Feuerungs—Oct. 1, 1913. No. 46059 D.

The Schnabel-Bone Boiler (Der Schnabel-Bone-Kessel). Fritz Krull. Brief outline of the Bone surface combustion method, and description of this type of boiler employed in the process. Ills. 1800 w. Zeit f d ges Turbinenwesen—Aug. 30, 1913. No. 46067 D.

See also same heading and Marine Boilers, under MARINE AND NAVAL ENGINEERING, and Stresses, under *Measurement*.

Boiler Scale

Pneumatic Scaling Tools. Illustrates and describes a new form of tube-scaling tool and a new form of pneumatic scaling hammer. 1600 w. Engng—Jan. 17, 1913. No. 39475 A.

New Light on the Chemistry of Boiler Scale Prevention. Edgar T. Wherry and George S. Chiles. Surprising effects explained by colloid action. 3000 w. Engineering Magazine — June, 1913. No. 43097 B.

Boiler Specifications

Uniform Boiler Specifications. Thomas E. Durban. Read before the Am Boiler Mfrs' Assoc. Urging that steps be taken to secure a uniform specification for all states and showing its importance. 3500 w. Boiler Maker—Sept., 1913. No. 45217.

Boiler Tests

Tests of Jacobs-Shupert Boiler. Outlines tests made by Dr. W. F. M. Goss, and states results of the tests. Also editorial. 6000 w. Am Engr—Feb., 1913. No. 39719 C.

Tests of a 1000-H.P. 24-Tubes High B. & W. Boiler. Discussion of B. N. Bump's paper. 2000 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41303 D.

Boiler Waters

Chemical Indicators in Volumetric Work.—Preparation of Normal Solutions, and Determination of Chlorine in Boiler Water. H. T. Dyer. Directions for determining the degree of acidity or alkalinity and the amount of chlorine. 2500 w. Jour Am Soc of Nav Engrs—Aug., 1913. No. 45169 H.

Soda-Ash for Boiler Waters. Charles H. Bromley. Deals chiefly with troubles experienced when using soda-ash in boiler waters. 1000 w. Power—Sept. 16, 1913. No. 45130.

Combustion

Flameless Combustion and its Importance in Industry (Die flammenlose Ver-

Consult Classification of the Index. See page 9.

Combustion

brennung und ihre Bedeutung für die Industrie). Richard Blum. Studies on the application of surface combustion in boilers of the Schnabel-Bone type. Ills. 4800 w. Zeit des Ver deutscher Ing—Feb. 22, 1913. No. 40541 D.

Principles of Combustion. Elementary explanation. 2500 w. Power—April 22, 1913. Serial. 1st part. No. 41568.

Surface Combustion. William A. Bone. Reviews briefly the work of early investigations, and the author's own work in this field, describing the new processes of incandescent surface combustion and the results. Ills. 10800 w. Trans N-E Coast Inst of Engrs & Shipbldr—April, 1913. No. 42264 N.

Specific Heats of Gases for Engineering Calculations. G. B. Upton. A collection and comparison of the experimental data now available. 2200 w. Sib Jour of Engng—April, 1913. No. 42333 C.

The Bonecourt Process of Surface Combustion. C. D. McCourt. The process consists essentially in passing a mixture of gas and air in the proportions for complete combustion through or over porous bodies. Ills. 3500 w. Elect'n, Lond—May 2, 1913. Serial. 1st part. No. 41997 A.

Flameless Surface Combustion (Flammenlose Oberflächenverbrennung). B. Neumann. A review of Professor Bone's theories and designs as indicated in various periodicals. Ills. 3100 w. Stahl u Eisen—April 10, 1913. No. 42108 D.

Heating Furnaces with Flameless Gas Firing (Wärmöfen mit flammenloser Gasfeuerung). Herr Canaris. Brief description of two furnaces designed by the Bonecourt Company. Ills. 1000 w. Feuerungs—Aug. 1, 1913. No. 44678 D.

See Boilers, under *Steam Engineering*.

Condensation

A Theory of Surface Condensation. D. B. Morison. Submits a theory for the solution of the problem of surface condensation. Ills. 3000 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40855 H.

Surface-Condensing Plant. A. Beeston. Read before the Int. Assn. for Col. Mgrs. Discusses the principles of modern types of surface-condensing plants in general use. Ills. 2700 w. Ir & Coal Trds Rev—Feb. 28, 1913. Serial. 1st part. No. 40495 A.

Modern Condensing Systems. A. E. Leigh Scanes. Indicates the lines along which development in condensing systems has taken place during recent years. Ills. 5800 w. Inst of Mech Engrs—Feb. 14, 1913. No. 40312 N.

Cooling by the Discharge of Saturated Steam (Die Unterkühlung beim Ausfluss

STEAM ENGINEERING

Condensers

gesättigten Dampfes). A. Stodola. A series of experiments and their results. Ills. 4000 w. Schweiz Bau—April 26, 1913. No. 42133 D.

Condensation Systems Without Air Pumps (Kondensationsanlagen ohne Luftpumpen). E. Josse. Describes systems operating by refrigeration. Ills. Serial, 1st part. 3000 w. Zeit f d ges Turbinenwesen—June 30, 1913. No. 43540 D.

The Breguet "Ejectair" (L'éjectair Breguet). Maurice Delaporte. Description of a novel condenser jet for both air and steam. Ills. 2800 w. Mem Soc Ing Civ de France—May, 1913. No. 43555 G.

Condensers

High Vacuum With Surface Condensers. P. E. Reynolds. Refers principally to large turbine units used with surface condensers having separate hotwell and dry-vacuum pumps. 1500 w. Power—Nov. 19, 1912. No. 37615.

Air in Surface Condensation. George A. Orrok. Gives results of investigations on the amount of air present in feedwater and the presence and effect of air in surface condensers, and describes an apparatus for measuring the air leakage. 2000 w. Jour Am Soc of Mech Engrs—Nov., 1912. No. 37876 D.

Test of a Surface Condenser: the Effect of a Spray at the Air-Pump Entrance. Fred Pickford and Gilbert Cook. Describes tests on a condenser which had been installed to take the steam from a 65-kw. turbo alternator. 2000 w. Engng—Jan. 17, 1913. No. 39474 A.

New Theory of Condensation. A theory presented by D. B. Morison. A thin film of air greatly reduces the heat transmission of a condenser tube. To remove it most efficiently V-shaped passages are proposed. 1500 w. Power—Jan. 21, 1913. No. 39240.

Development in Marine Condensers. Gives the main factors controlling heat exchange, the steam and water filter, and condenser data and performances. 1000 w. Power—Jan. 21, 1913. No. 39239.

Large High Tension Condenser Test. J. J. Brown. Gives data of a test of a condenser guaranteed to produce 28.9 in. of mercury with 70 deg. of cooling water. The guarantee was exceeded. Ills. 2500 w. Power—Feb. 25, 1913. No. 40111.

Condensing Plants for Large Commercial Buildings. Letter from W. L. Durand and reply by Ira N. Evans, discussing the feasibility, from a commercial standpoint, of the arrangement proposed in the Jan. 21 issue. 3000 w. Power—Feb. 18, 1913. No. 39895.

Consult Classification of the Index. See page 9.

Condenser Tubes

Comparative notes on Independent Steam Condensing Plants. W. A. Dexter. Abstract of paper read before the Newcastle Soc. of the Inst. of Elec Engrs. Surface and jet condensing plants are discussed and compared. Also air pumps. 4500 w. *Elect'n, Lond*—March 28, 1913. No. 41129 A.

Prime Movers and Condensing Apparatus. George E. Edwards. An explanation of points involved in maintaining satisfactory economy in steam units through condensing apparatus. 2000 w. *Min & Engng Wld*—May 3, 1913. No. 41877.

Air in Condensers. H. Fothergill. An analysis of ways which air may get into condensers, preventing the maintenance of high vacuums, and suggested remedies. Ills. 2000 w. *Power*—Oct. 28, 1913. No. 46213.

See also Turbines, under *Steam Engineering*.

Condenser Tubes

Condenser-Tube Corrosion. The lasting quality of condenser tubes is found to depend more upon their microstructure than upon their chemical compositions. Ills. 1200 w. *Power*—Oct. 14, 1913. No. 45814.

Barometric Condenser Piping. B. S. Nelson. Directions for properly piping a barometric condenser for reciprocating engines. Ills. 1000 w. *Power*—Oct. 21, 1913. No. 45946.

See Corrosion, under **ELECTRICAL ENGINEERING, Electro-Chemistry**.

Cooling Pond

New Sharp Mill Spray Cooling Pond. Warren O. Rogers. Illustrates and describes cooling pond with 120 spray nozzles at New Bedford, Mass. 1000 w. *Power*—March 11, 1913. No. 40382.

Cooling Towers

Cooling Towers and Ash Silo at the Wilmsdorf Power Station (Kamin-kühleranlage und Aschensilo der kraftstation Wilmsdorf). A. Boesig. Details in the construction of these reinforced concrete buildings. Ills. 2400 w. *Beton u Eisen*—Oct. 21, 1912. No. 37431 E.

Cooling-Towers at Edinburgh Power-Station. Drawings and description of two cooling-towers erected in connection with the city electric-light station. 1200 w. *Engng*—Feb. 28, 1913. No. 40484 A.

Cooling Towers for Industrial Establishments. Illustrated discussion of their construction and efficiency. 1700 w. *Sci Am Sup*—April 5, 1913. No. 41058.

Cooling Towers for the Power Plant. Everard Brown. Considers types and construction of towers, distribution of water and air, and principles of opera-

STEAM ENGINEERING**Engine Foundations**

tion. 2500 w. *Power*—Oct. 7, 1913. No. 45699.

Cylinder Packing

Pneumatic Cylinder-Packing Leathers. F. W. Bentley, Jr. Illustrated directions for replacing pneumatic cylinder packing, showing defects resulting from some methods employed. 1200 w. *Power*—Oct. 7, 1913. No. 45700.

Draft

The Balance Draft System of Furnace Regulation. Illustrated description of a System applied to boiler furnaces to maintain a uniform pressure for all rates of combustion. 1200 w. *Power*—Feb. 11, 1913. No. 39757.

The Significance of Drafts in Steam Boiler Practice. Walter T. Ray and Henry Kreislinger. First of a series of two or three bulletins on this subject, giving results of experimental investigations. 60 pp. *U S Geol Surv*—Bul 367. No. 41637 N.

Draft and Its Measurement. A discussion of points in chimney design. 2000 w. *Power*—Aug. 12, 1913. No. 44296.

Natural or Artificial Draft for Boiler Plants (Natürlich oder künstlicher Zug bei Dampfanlagen)? Friedrich Barth. Comparison by curves of natural and forced drafts at the chimney mouth, and the conditions under which each is more suitable. Ills. 7500 w. *Zeit des Ver deutscher Ing*—Sept. 13, 1913. No. 46039 D.

See also Boiler Losses, under *Steam Engineering*, and Fans, under *Heating and Cooling*.

Economies

Boiler Plant Economies. Erle Ormsby. Discusses the essentials of high-class results, types of boilers, scale, etc. 2500 w. *Ice & Refrig*—April, 1913. No. 41080 C.

Engine Balancing

Engine Balancing. J. M. Duncan. Discusses the problem of balancing various types of engines. Ills. 5000 w. *Ap Sci*—Oct., 1912. No. 37699 C.

See same heading, under **MARINE AND NAVAL ENGINEERING**.

Engine Design

The Vagaries of Engineering Practice. J. Hamilton Gibson. Read before the Liverpool Engng. Soc. Especially considers engine and boiler design. 3500 w. *Engr, Lond*—Jan. 10, 1913. No. 39275 A.

Engine Diagrams

Mean Effective Pressure. M. J. Eichhorn. Shows how the calculations may be simplified by the application of the methods of nomography. 2000 w. *Ice & Refrig*—Feb., 1913. No. 39630 C.

Engine Foundations

Engine Foundations. J. Leslie. Dis-

Consult Classification of the Index. See page 9.

Engines

cusses the essentials of a proper foundation, the different materials and how to construct them. Ills. 2000 w. Mech Wld—Nov. 29, 1912. Serial. 1st part. No. 38127 A.

Engines

The Bicentenary of the Steam Engine. Information concerning the Newcomen invention of the reciprocating steam engine in 1712. Ills. 1500 w. Engr, Lond—Nov. 8, 1912. No. 37647 A.

An Improved Steam Engine. Illustrated description of the Paxman-Lentz steam engine. 1500 w. Prac Engr—Dec. 12, 1912. No. 38388 A.

The Overtone or High Superheated Steam Engine. George Duncan Moffat. Read before the Engrg. Assn. of N. S. W. Describes this type of prime mover and gives information related. Ills. 4000 w. Aust Min Stand—Nov. 7 and 14, 1912. Serial. 2 parts. No. 38108 each B.

Progress of Wolf Locomobile Engines. F. E. Junge. Information from a recently published memorial which shows an increase during the past fifty years from 8 to 80 h. p. Ills. 1500 w. Power—Dec. 31, 1912. No. 38697.

The Lentz System Applied to Steam Engines. Seigfried Rosenzweig. Abstract of a lecture before the Ithaca Sec. of A. S. M. E. Illustrated description of this modern reciprocating engine and its advantages. Ills. 3000 w. Sib Jour of Engrg—Jan., 1913. No. 39954 C.

Steam Engines: Turbine and Rotary. J. T. Fowlson. Reviews the development of rotary engines and discusses the essential differences between turbines and rotaries. 1300 w. Prac Engr—Feb. 20, 1913. Serial. 1st part. No. 40308 A.

Water Blow in Steam Engines. A report of tests carried out by a Belgian firm to determine the causes of water blow. Ills. 3000 w. Engr, Lond—April 18, 1913. No. 41778 A.

The Shuman-Haines Steam Engine. An illustrated account of the development, and information concerning recent tests. 3500 w. Engr, Lond—May 30, 1913. No. 42788 A.

Recent Improvements in the Reciprocating Engine Art. Illustrates and describes the Stumpf "uni-directional flow" steam engine, the Norton controlling gear, and other improvements. 2500 w. Sci Am—July 12, 1913. No. 43498.

The "Flat-Curve" Engine. A. D. Skinner. Aims to prove that the cause of the much greater steam consumption at light loads is due to valve leakage. 1600 w. Power—July 29, 1913. No. 43947.

An Interesting Steam Engine Conversion. Illustrations and brief description

STEAM ENGINEERING

Engine Valves

of the conversion of a three-crank compound steam engine to a uniflow engine. 300 w. Engr, Lond—July 18, 1913. No. 43978 A.

Economy of Compression in Steam Engines. Robert R. Fisher. Tests at the Kansas State University lead to conclusion that compression up to about 45 per cent. of the initial absolute steam pressure is advantageous. 1500 w. Power—July 29, 1913. No. 43948.

Calculations of Double Expansion Alternating Steam Engines (Il calcolo delle motrici a vapore alternative a doppia espansione). Guglielmo Piperno. Formulae and coefficients for the calculation of cylinder dimensions, etc. Diagrams. Serial, 1st part. 3000 w. Industria—June 29, 1913. No. 43591 D.

The Drop-valve Engine in Its Modern Development. Discusses the latest development in drop-valve engine practice, describing engines equipped with this style of gear. 1000 w. Mech Wld—Oct. 3, 1913. Serial, 1st part. No. 45853 A.

Lentz Engines in Baltimore Office Building. Warren O. Rogers. Illustrated description of the power plant of a large office building. 1500 w. Power—Oct. 21, 1913. No. 45945.

Reciprocating Engines or Turbines (Kolbenmaschine oder Turbine)? Hr. Kraft. A study of the relative economy of these types in naval service. Diagrams. Serial, 1st part. 1800 w. Turbine—Sept. 5, 1913. No. 46062 D.

Engine Tests

Reversing Engine and Turbine Efficiency Tests. J. A. Knesche. Comparison of the relative economy of the two machines for driving a blowing mill, with detailed data on rolling ingots. 5000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38741 D.

A Comparative Trial Between the Triple Expansion Engine and Geared Turbines in Cargo Steamers. C. Waldie Cairns. Read before the N-E Coast Inst of Engrs & Shipblds. Gives results of this recent trial of vessels of the Cairn Line of steamships. Ills. 2500 w. Mech Engr—April 18, 1913. Serial. 1st part. No. 41758 A.

Engine Valves

Some Notes on the Slide Valve. L. Holder. Explains why lap and lead are used on the valve and the effect they have on the stroke. Diagrams. 1200 w. Power—Dec. 24, 1912. No. 38359.

Mason's Regulator for Reducing Valves. Illustrated description of a double-acting regulator, used in connection with a relay reducing-valve system. 800 w. Engrg—Jan. 17, 1913. No. 39476 A.

Evaporators

Setting Corliss Engine Valves. J. K. McIntyre. Drawings and directions for setting the valves for the first time. 1500 w. Power—Dec. 31, 1912. No. 38698.

See also Locomotive Valves, under *RAILWAY ENGINEERING, Motive Power and Equipment*.

Evaporators

The Lillie Quadruple Evaporator, U. S. S. Dixie. Illustrated description and report of test. 4000 w. Jour Am Soc of Nav Engrs—Feb., 1912. No. 40858 H.

Tests Upon the Transmission of Heat in Vacuum Evaporators. E. W. Kerr. Deals with tests made to determine the effect of hydrostatic head, density of heating steam, and other factors which influence the transmission of heat. Ills. 6000 w. Jour Am Soc of Mech Engrs—Oct., 1913. No. 46142 D.

Exhaust Steam

Development in Auxiliary Units Between Exhaust Pipe and Boiler. William Weir. Read before the Inst. of Engrs. & Shipbldrs. in Scotland. Considers the various forms of apparatus and some results of performance. Ills. 3000 w. Mech Engr—Nov. 1, 1912. Serial. 1st part. No. 37393.

Utilization of Exhaust Steam at Collieries and Mines. J. M. Gordon. Describes the applications and possibilities. 5000 w. Qr Bul of Can Min Inst—March, 1913. No. 41604 N.

Should Exhaust Steam Be Wasted? P. Barrett Coulston. Gives examples of installations of steam turbines to utilize steam ordinarily wasted in exhaust. 2000 w. Col Engr—Aug., 1913. No. 44121 C.

See also same heading, under *Heating and Cooling*.

Feed Pump

Test of a Warren Vertical Single Boiler Feed Pump at the Naval Engineering Experiment Station, Annapolis, Maryland. Gives a description of the pump and method of test, with results. Ills. 3500 w. Jour Am Soc of Nav Engrs—May, 1913. No. 42922 H.

Feed Water

Softening Feed Water for Boilers. Describes the Royles' process and plant. Ills. 1800 w. Prac Engr—Nov. 14, 1912. No. 37706 A.

Softening of Boiler Water Feeds. H. A. Carter. A general review of methods of softening and the need of purification. 8000 w. Aust Min Stand—Feb. 27, 1913. No. 40995 B.

The Production of Additional Boiler Feed-Water by Means of Condensers in Stationary Plants (Die Erzeugung von Zusatzwasser zur Kesselspeisung durch Verdampferapparate im Betriebe ortfes-

STEAM ENGINEERING**Fuel Gas**

ter Anlagen). A. Höpfl. Plans for a simple and economic condensing arrangement. Ills. 3000 w. Zeit des Ver deutscher Ing—March 22, 1913. No. 41464 D.

Filtering Feed Water. Charles S. Linch. Discusses the function of the feed filter, its most desirable location, requirements, etc. 1500 w. Int Marine Engng—June, 1913. No. 42600 C.

Salt in Boiler Feed Water. E. E. Wilson. Considers the source of salt in boiler feed and the methods of eliminating it. 2200 w. Jour Am Soc of Nav Engrs—May, 1913—No. 42921 H.

Fireboxes

Riegel Watertube Firebox Design. S. S. Riegel. Drawings and description. 1000 w. Boiler Maker—July, 1913. No. 43730.

Fitting

Steam Pipe Death Traps. W. M. Wallace. Shows the need of more attention to steam pipe fitting; discusses explosions and their causes. Ills. 1800 w. Prac Engr—Sept. 25, 1913. No. 45633 A.

Flue Gas

Practical Flue Gas Analysis. Harry A. Cox. Shows that a knowledge of chemistry is not necessary to operate the Orsat. 1500 w. Power—Nov. 19, 1912. No. 37614.

Determining SO₂ in Flue Gas. F. G. Hawley. Describes a method which depends on filtering the SO₂ out from the SO, and then determining it. 1700 w. Eng & Min Jour—Nov. 23, 1912. No. 37764.

Heat Losses in Flue Gases. Discussion of heat lost up the chimney, method of estimating heat lost in flue gases, etc. 1000 w. Power—July 22, 1913. Serial, 1st part. No. 43945.

Flue Gas Analysis and Its Advantages. Arthur E. Jones. Abstract of a paper read before the Inst. of Marine Engrs. Urges the importance of installing CO₂ recorders and of the management of the air supply. 2500 w. Mech Engr—Oct. 17, 1913. No. 46232 A.

Flues

Working Pressures of Plain Steel Flues with Adamson Flanged Joints, Calculated to British Board of Trade Rules and also to Lloyd's Rules of British and Foreign Shipping. W. R. Allen. Tables and explanatory notes. 2000 w. Boiler Maker—July, 1913. No. 43729.

Fuel Gas

Commercial Practice of Fuel Gas Production. Explains the theory and practice of producers as employed in making furnace gas. 6000 w. Ir Trd Rev—March 13, 1913. No. 40630.

Practical Knowledge in Gas Firing for

Consult Classification of the Index. See page 9.

Fuel Oil

STEAM ENGINEERING

Fuels

Boiler Plants (Erfahrungen an Gasfeuerungen für Dampfkessel). Herr Barth. Hints on the arrangement of burners, etc., for best results. Ills. 2400 w. Feuerungs—Feb. 15, 1913. No. 40560 D.

See also Furnace Fuels, under *Machine Works and Foundries*.

Fuel Oil

The Use of Oil as a Fuel. A. O. Kriegler. A discussion of recent changes in the fuel oil market and prices. 2000 w. Eng News—Nov. 21, 1912. No. 37731.

Oil Fuel and the Corrosion of Boilers. Abstract from the memorandum of C. E. Stromeyer. The expense prohibits the use of oil in England, Germany and other countries, but its advantages and disadvantages are considered. Reports results of research work on the corrosion of iron and steel. 3300 w. Elect'n, Lond—Nov. 1, 1912. No. 37390 A.

Liquid Fuel, Its Use and Abuse. W. N. Best. Describes liquid fuel, explaining its calorific value, and discusses its applications to boilers, furnaces, etc. General discussion. 10000 w. Pro N Y R R Club—Oct. 18, 1912. No. 37910.

Liquid Fuel in the Foundry. W. N. Best. From a paper before the Phila. Found. Assn. Suggestions for burning liquid fuel, the burners, etc. 1000 w. Foundry—Nov., 1912. No. 37237.

Oil Burning Government Smith Shop. C. A. Harrington. Gives details of a successful oil-burning installation at the Portsmouth Navy Yard. 2000 w. Am Mach—Nov. 14, 1912. No. 37383.

Fuels

Experiments with North Dakota Lignite in a Steam Power Plant and a Gas Producer. Calvin H. Crouch. Information concerning the extent of the lignite fields, and report of experiments showing the physical properties of the coal, and power plant tests. Ills. 4000 w. Jour Am Soc of Mech Engrs—Dec., 1912. No. 38505 D.

Experiments with North Dakota Lignite in a Steam Power Plant and a Gas Producer. Discussion of Calvin H. Crouch's paper. 1600 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41308 D.

The Use of Low-Grade Fuels From the Mines of the Dortmund Mining District 15 (Ausnutzung minderwertiger Brennstoffe auf Zechen des Oberbergamtsbezirks Dortmund XV.). Herrn Bütow and Döbelstein. Details some furnaces specially adapted to the use of these fuels. Ills. 2100 w. Glückauf—Dec. 28, 1912. No. 39026 D.

Pulverized Coal as a Fuel. H. R. Barnhurst. States the requirements neces-

sary to success, discussing them in order. 3000 w. Met & Chem Engng—March, 1913. No. 40328 C.

Utilization of Pulverized Fuel for Boiler Firing. C. H. Wright. Considers the difficulties encountered in using pulverized fuel, with illustrated description of an installation that overcomes some of the difficulties. 1200 w. Elec Wild—March 15, 1913. No. 40670.

The Economic Combustion of Low-Grade or Waste Fuels. David Moffat Myers. First of Three Articles discussing the subject. The present number considers the principles involved. 3000 w. Engineering Magazine—April, 1913. No. 40912 B.

The Economic Combustion of Low Grade or Waste Fuels. David Moffat Myers. Discusses furnaces and methods suited to wood by-products. Second article of a series. Ills. 5000 w. Engineering Magazine—May, 1913. No. 41632 B.

The Economic Combustion of Low Grade or Waste Fuels. David Moffat Myers. This third article of a series considers the burning of bagasse, culm and city refuse. Ills. 4500 W. Engineering Magazine—May, 1913. No. 42489 B.

Pulverized Coal as a Fuel. A. W. Raymond. Deals with the method of burning the coal dust, and facts gained from investigation, experience and tests. 1500 w. Cement & Engng News—April, 1913. No. 41256.

The Rational Utilization of Coal. F. E. Junge. Describes practice, common in Germany, in which inferior grades of coal are used at the mouth of the mines in coke ovens and producers. The gas is used for producing high-tension electric current and innumerable by-products are obtained. 2000 w. Power—April 1, 1913. No. 40965.

Fuel Problems of the Pacific. H. Foster Bain. Discusses coaling facilities on the Pacific, and the fuel oil and its adoption by coastwise steamers. The bearing of the fuel distribution upon the new trade alignment expected to follow the opening of the Panama Canal. Discussion. 6500 w. Jour Can Mun Inst—Vol. XV. No. 42048 N.

The Specific Properties and Differences of Solid and Fluid Fuels and Their Scientific Importance (Die spezifischen Eigenschaften und Unterschiede der festen und flüssigen Brennstoffe und ihre technische Bedeutung). Dr. Aufhäuser. A chemical study of fuel values. 7300 w. Glückauf—April 19, 1912. No. 42116 D.

Gaseous Fuels in the Year 1911 (Die gasförmigen Brennstoffe in Jahre 1911). Drs. Bertelsmann and Hörmann. A study, in this part, of natural gas, flue

Fuels

gas, motor gas and water gas. Serial. 1st part. 2100 w. Oest Zeit f Berg u Hütten—April 19, 1913. No. 42122 D.

Estimating Heat Value of Fuel. Brief description of a coal calorimeter for measuring the heat, and explanation of method of obtaining heat value by calculation. 2000 w. Power—June 10, 1913. No. 42735.

Liquid Fuel. Vivian B. Lewes. This first lecture discusses the theory of the formation of oil. 6000 w. Jour Soc of Arts—May 23, 1913. Serial. 1st part. No. 42738 A.

Efficiency Valuation of Fuels. W. F. Elwood. Calls attention to the importance of other factors than British thermal units and the fusing point of ash. 2500 w. Col Engr—Aug., 1913. No. 44120 C.

The Specific Properties and Differences of Solid and Liquid Fuels and Their Scientific Importance (Die spezifischen Eigenschaften und Unterschiede der festen und flüssigen Brennstoffe und ihre technische Bedeutung). Dr. Aufhäuser. An analysis and heating properties of various combustibles. 4200 w. Stahl u Eisen—July 24, 1913. No. 44608 D.

The Problem of Burning Pulverized Fuel. Sterling H. Bunnell. Reports promising results with powdered coal in a vertical steam boiler. 1500 w. Ir Age—Sept. 18, 1913. No. 45204 C.

See Boilers, Oil Fuel, Fuel Oil and Fuel Gas, under *Steam Engineering*, and Fuels, under *Combustion Motors*, and under *Automobiles*, and same heading, under *Railway Engineering*, *Motive Power and Equipment*. See also Coal Dust, under Mining and Metallurgy, *Coal and Coke*.

Fuel Testing

Determining Coal Values. E. G. Bailey. Brief discussion of the determination of the calorific value of a coal. 1500 w. Mines & Min—Nov., 1912. No. 37185 C.

Gas-Firing

Points on Gas-Fired Boilers. K. Huesener. Gives results of investigations by the writer, discussing combustion arrangements, the two systems of efficient gas-firing, etc. Ills. 3500 w. Ir & Coal Trds Rev—June 13, 1913. No. 43170 A.

A System of Burning Producer Gas. C. M. Garland. Discusses the combustion of gases and the replacement of fuel oil, with special reference to the combustion of lean gases. Ills. 2500 w. Ir Age—Sept. 25, 1913. No. 45440 C.

Degree of Efficiency of Boilers Heated by Blast-Furnace and Coke-Oven Gases and Heat Requirements of Gas Engines (Wirkungsgrad von Dampfkesseln mit

STEAM ENGINEERING

Indicators

Hochofen- und Koksofengas-Heizung und Wärmeverbrauch von Gasmaschinen). H. Ortmann. Tabular results of experiments with both fuels and a test with a gas engine. 2000 w. Stahl u Eisen—Aug. 21, 1913. No. 45378 D.

Gauges

Protection of Water Gauge Glasses. Alex. M. Gow. Discusses causes of breakage, precautions and illustrates and describes guards, shields and types of gauges. 2500 w. Locomotive—Jan., 1913. No. 39502.

Governors

Improvement in the Construction of the Valve Gear of Shaft Governors, with Remarks on the Theory of Centrifugal Governors (Fortschritte im Bau von Flachregler-Ventilsteuerungen nebst einem Beitrage zur Theorie der Fliehkraftregler). R. Proell. Detailed mathematical study. Ills. Serial, 1st part. 5400 w. Zeit des Ver deutscher Ing—Aug. 16, 1913. No. 44658 D.

Heat Economy

Transformation of Energy (Umwandlung der Energie). A. Riedler. Dissertation comparing the effective power of internal-combustion engines with steam engines and turbines. 4500 w. Auto Rund—Aug. 31, 1913. No. 46053 D.

Indicator Cards

The Mean Indicator Card. George E. Scholes. Explains a method of using composite photography to obtain a mean indicator card quickly. 700 w. Engng—Jan. 10, 1913. No. 39259 A.

Indicator Diagrams

The Lanza Continuous Diagram Appliance for Engine Indicators. Illustrated description of the appliance. 800 w. Engng—Feb. 28, 1913. No. 40488 A.

Characteristic Diagrams (Diagramm-Charakteristiken). Bruno Leinweber. A thermodynamic study of indicator diagrams and their interpretation. 5500 w. Zeit des Ver deutscher Ing—April 5, 1913. No. 41469 D.

An Investigation of Professor Clayton's Method for the Study of Reciprocating Steam Engines (Examen de la méthode du Professeur Clayton pour l'étude des machines à vapeur à piston). M. Dwelshauvers-Dery. A further series of research contributed to previous investigations. Diagrams. 8000 w. Rev de Mecan—April 30, 1913. No. 43061 E + F.

Indicators

Design of Indicator Reducing Rigs. A. L. Westcott. Illustrates and describes several types of indicator reducing methods. 1500 w. Power—Nov. 19, 1912. No. 37616.

Indicators. James G. Stewart. De-

Consult Classification of the Index. See page 9.

Intensifiers

scribes experiments made to determine errors. Ills. 9500 w. Inst of Mech Engrs—Jan. 17, 1913. No. 39786 N.

See also Engine Diagrams, under *Steam Engineering*.

Intensifiers

The Design of Hydraulic Intensifiers. A. Lewis Jenkins. An analysis of plain, steam and steam-hydraulic intensifiers, both as to their design and most advantageous uses. Ills. 1500 w. Am Mach—Jan. 30, 1913. No. 39544.

Laundries

Design of Commercial or Steam Laundries. William Paul Gerhard. Describes a typical layout and the requirements for equipment and ventilation of a model steam laundry. Ills. 2500 w. Met-Work—Aug. 29, 1913. No. 44795.

Locomobile

The First American Locomobile. F. R. Low. Illustrated description of the "Buckeyemobile," a self-contained, superheated, steam-driven unit. 2000 w. Power—May 20, 1913. No. 42234.

Present Status of the Locomobile. Warren H. Miller. Outline of this machine, which is a combination of boiler, engine and superheater, compactly assembled, with description of recent European and American types. Ills. 1500 w. Elec Wld—Aug. 16, 1913. No. 44416.

800-Brake-Horse-Power Locomobile. Illustrates and describes two similar compound condensing superheated-steam locomobiles of 800 h.p. each. 1200 w. Engng—Oct. 3, 1913. No. 45859 A.

The Uniflow Cylinder Adapted to Locomobiles. Warren H. Miller. Outlines the most recent improvements in locomobiles. Utilization of the unidirectional steam-flow scheme for minimizing cylinder condensation. Ills. 1800 w. Elec Wld—Oct. 4, 1913. No. 45682.

Losses

Losses in the Steam Cylinder. R. C. H. Heck. A study of general relations and various steam quantities, calculations of indicated steam consumption, and the construction of the diagram of specific steam rates. 2800 w. Power—Nov. 5, 1912. No. 37272.

Oil Fuel

Experiments with an Oil Burning Shaft Furnace. Albert L. Waters. A record of promising experiments which had to be abandoned for lack of capital. Ills. 2000 w. Eng & Min Jour—Aug. 2, 1913. No. 44129.

The Supply of Coal Tar, Tar Oils and Pitch. W. J. A. Butterfield. Considers the supplies available in England, prices, etc. 6500 w. Surveyor—Feb. 28, 1913. No. 40473 A.

STEAM ENGINEERING**Piping**

Oil as a Fuel. Reginald Trautschold. Discussion of the use of oil as a fuel for generating steam. 2500 w. Power—March 4, 1913. No. 40301.

Oil as a Supplementary Fuel in Steam Power Plants. Reginald Trautschold. Describes the equipment needed and the advantages secured. 2000 w. Engineering Magazine—Aug. 1913. No. 43915 B.

Requirements for Efficient Burning of Oil Fuel. R. T. Strohm. Discusses the essentials for the successful burning of crude oil or fuel oil. 1000 w. Elec Wld—July 19, 1913. No. 43842.

Burners for Oil Fuel. R. T. Strohm. Discusses the important features of a good burner, and illustrates and describes types. 1000 w. Elec Wld—Aug. 16, 1913. Serial, 1st part. No. 44418.

Cleaning of Oil Fuel. R. T. Strohm. Illustrates and describes strainers used. 1800 w. Elec Wld—Sept. 13, 1913. No. 45118.

Methods of Spraying Oil Fuel. R. T. Strohm. Describes various systems and burners. 1500 w. Elec Wld—Sept. 6, 1913. No. 45012.

Pumping and Heating of Oil Fuel. R. T. Strohm. Illustrates and describes method of obtaining uniform oil pressure, and the object of the heater. 2200 w. Elec Wld—Sept. 27, 1913. No. 45495.

Oil Fuel for Steam Boilers. R. T. Strohm. Considers the factors that determine whether oil shall be used for fuel in preference to coal, and discusses the characteristics and constituents of oil. 2000 w. Elec Wld—Oct. 4, 1913. No. 45683.

See also Furnace Fuels and Furnace Heating, under *Machine Works and Foundries*, and Oil Fuel, under *MARINE AND NAVAL ENGINEERING*. See also Boilers and Fuel, under *Steam Engineering*.

Piping

Steam Power Plant Piping Details. William F. Fischer. Drawings and explanation of the general requirements of a well-designed piping system. 6000 w. Mach, N Y—Feb., 1913. Serial, 1st part. No. 39604 C.

Expansion Joints in Pipes (Kompensierende Rohrverbindungen). Henry Menk. Reviews types of expansion joints for superheated steam requirements. Ills. 2200 w. Die Turbine—Jan. 5, 1913. No. 40052 D.

The Flow of Steam in Pipes. A. E. Berggren. Applies data based on research work to one of the generally accepted formulae for the flow of steam in pipes. 2500 w. Wis Engr—March, 1913. No. 41574 C.

Pipe Sizes and Steam Velocities. C. W.

Consult Classification of the Index. See page 9.

Piston Rings

STEAM ENGINEERING

Stacks

Ham. Discussion of the Determining considerations in selecting sizes for high-pressure piping in power stations, and velocities of steam. 1500 w. Power—April 22, 1913. No. 41565.

Expansion in High-Pressure Steam Piping. Shows how to locate the anchorage of a simple piping arrangement to secure the best utilization of the material through a uniform distribution of the stresses. Ills. 1500 w. Ind Engng—Aug., 1913. No. 44158 C.

The Conductive Resistance of Superheated Steam in Smooth and Corrugated Expansion Pipes (Leitungswiderstand überhitzten Dampfes in glatten und in gewellten Ausgleichsrohren). C. Bach and R. Stücker. A comprehensive study of the relative merits of both pipes for use with superheaters. Ills. 5400 w. Zeit des Ver deutscher Ing—July 19, 1913. No. 44653 D.

Piston Rings

Pressure-Balanced Piston Rings. Illustrates and describes improvements recently introduced in connection with piston and valve rings. 1500 w. Engr, Lond—May 16, 1913. No. 42544 A.

Smoke

Smoke Perplexities of the Architect. Raymond C. Benner. Remarks on the rapid disfigurement and damage due to smoke, its effect on various materials, and the change wrought by the proper furnace and boiler equipment. 2200 w. Am Arch—April 16, 1913. No. 41323 C.

A Study on Smoke Consumption (Étude sur la fumivorie). A. Boyer-Guillon. A detailed review of the subject with an historical sketch of enactments and devices, with recent appliances and their utility. Ills. 6400 w. Rev de Mecan—July, 1913. No. 45330 E + F.

See same heading, under CIVIL ENGINEERING, *Municipal*.

Smoke Prevention

Practical Methods of Abating Smoke. J. M. Searle. Discusses combustion and describes the requisites of a locomotive stoker. Ills. Also general discussion. 9000 w. Pro Ry Club of Pittsburgh—Nov. 22, 1913. No. 39307 C.

New Methods of Approaching the Smoke Problem. Osborn Monnett. Outlines the methods of the Chicago Smoke Department, and their attempts to classify and tabulate smoke offenders. General discussion. 10000 w. Jour W Soc of Engrs—Dec., 1912. No. 39338 D.

Notes on Smoke Prevention in the Rhine-Westphalian Industries (Beiträge zur Beurteilung von Rauchschäden im rheinisch-westfälischen Industriegebiet).

P. Rippert. Reviews the question of smoke damage on vegetation; the value of smoke absorbers and work accomplished in prevention. Serial. 1st part. 6100 w. Glückauf—Dec. 7, 1912. No. 39005 D.

The Smoke Problem from an Economic Standpoint. Charles W. Fulton. Abstract of a paper read before the Textile Inst., at Manchester, Eng. Considers how present installations can be made smokeless with an increase of profit; and what is the best system to adopt for new installations. 4000 w. Mech Engr—May 9, 1913. No. 42281 A.

The Elimination of Smoke. D. F. Crawford. Lecture delivered at the New Century Club. The sources and causes of smoke are discussed, especially considering the railways and devices for the elimination of locomotive smoke. 1800 w. Sci Am Sup—June 14, 1913. No. 42822.

The Problem of Smoke Abatement. William A. Hoffman. The subject is discussed with special reference to what has been accomplished in St. Louis. Mechanical stokers and their advantages are explained. Ills. General discussion. 10000 w. Jour Assn of Engng Soc—June, 1913. No. 43244 C.

See also same heading, under RAILWAY ENGINEERING, *Motive Power and Equipment*, and *Atmospheric Pollution* and *Smoke*, under Civil Engineering, *Municipal*.

Stacks

Dimensions of Boiler Chimneys for Crude Oil at Sea Level and at Various Altitudes, with Correcting Factors for Fuel Economizers. Discussion of C. R. Weymouth's paper. 1000 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41305 D.

Circular Smoke Currents in Flues. John R. Bell. Discussion on the natural movement of heated air and smoke in chimney and its bearing on design of flues. Ills. 1500 w. Metal Work—May 23, 1913. No. 42343.

Erecting a Steel Smoke-stack on a High Roof. Describes work executed for the United Electric Light & Power Company, New York City. 2000 w. Eng Rec—May 24, 1913. No. 42378.

Repairs to a Reinforced-Concrete Chimney. C. E. Smith. Describes work on a chimney at Kansas City, Mo. Ills. 1200 w. Eng News—May 8, 1913. No. 41945.

The Stability of Brick Chimneys. Harold Cane. From a paper read before the Concrete Inst. Gives results of recent investigations. Ills. 1500 w. Ir & Coal Trds Rev—May 16, 1913. No. 42549 A.

Chimney Design. Explains principles

Consult Classification of the Index. See page 9.

Steam

of natural draft and method of estimating the draft required. 2000 w. Power—Aug. 19, 1913. No. 44442.

See same heading, under Civil Engineering, Construction; and Boiler Losses and Draft, under *Steam Engineering*, and Smelter Flues, under MINING and METALLURGY, Copper.

Steam

Dalton's Law in the Steam Plant. George F. Fenno. States the law and considers its application to vapors and the part of the law relating to evaporation. 1500 w. Power—Dec. 31, 1912. No. 38701.

The Specific Heat and Specific Volume of Steam at Pressures of 20 Atmospheres and Temperatures of 550 Degrees Cent. (Die spezifische Wärme und das spezifische Volumen des Wasserdampfes für Drücke bis 20 at und Temperaturen bis 550°C.). Max Jakob. Mathematical. Diagrams. 4800 w. Zeitschr des Ver deutscher Ing—Dec. 7, 1912. No. 39033 D.

Steam Consumption

Steam Consumption Computations. J. A. Knesche. Explains method and illustrates its application by examples. 1500 w. Power—Nov. 12, 1912. No. 37374.

Steam Engineering

See same heading, under MARINE AND NAVAL ENGINEERING.

Steam Engines

The Bi-Centennial of the Steam Engine. Erick H. Low. Brief history of the steam engine. Ills. 1000 w. Power—April 8, 1913. No. 41125.

Steam Flow

Theory and Experiment in the Flow of Steam Through Nozzles. J. B. Henderson. Read before the Inst. of Mech. Engrs. A summary of experimental work with statement of theory and suggestions for further experiments. Ills. 4500 w. Mech Engr—Nov. 22, 1912. No. 38025 A.

The Flow of Steam Through Pipes. H. V. Carpenter. Gives charts for determining the amount of steam which will flow per minute through a pipe of given diameter, illustrating the use by example. 800 w. Power—Dec. 17, 1912. No. 38217.

The Flow of Steam Through Pipes. H. V. Carpenter. Gives charts covering low pressures and large pipes, with notes. 500 w. Power—June 10, 1913. No. 42733.

The Flow of Steam Through Orifices (Der Ausfluss des Wasserdampfes aus Mündungen). August Loschke. The results of numerous experiments. Ills. Serial, 1st part. 4200 w. Zeitschr des

STEAM ENGINEERING

Superheating

Ver deutscher Ing—Jan. 11, 1913. No. 40040 D.

Steam Jacketing

Jacketing Applied to Steam Cylinders. Extract from an article by Dr. Hubert Hansel, in the *Zeit des Ver. Deut. Ing.* Shows the effect of superheated steam with and without jacketing, partial jacketing, and the economy. 2500 w. Power—March 18, 1913. No. 40689.

Steam Piping

Steam Power Plant Piping. William F. Fischer. The merits and demerits of cast-iron pipes and flanges, and riveted steel, brass and copper pipes are considered. 1000 w. Power—Nov. 5, 1912. No. 37274.

Steam Plants

The Utilization of Exhaust Steam (L' utilizzazione del vapore di scarico negli impianti termici). Giuseppe Brezzi. Paper presented at Congress for the Advancement of Science at Genoa, October, 1912. Serial, 1st part. 2100 w. Industria—Jan. 12, 1913. No. 39099 D.

An Instructional Steam Plant. Illustrated detailed description of an experimental steam engine for the University of Queensland. 1000 w. Engr, Lond—Aug. 22, 1913. No. 44928 A.

Steam Pressures

The Desirability of Using High Mean Referred Pressures. E. M. Bragg. Gives conclusions of R. Royds, Prof. Weighton, and others. 1600 w. Jour Am Soc of Nav Engrs—Feb., 1913. No. 40856 H.

Steam Pump

A New Direct-Acting Steam Pump. Illustrated description of an interesting pump, the valve gear of which is a striking departure, and possesses features which appear to place it quite in a class by itself. Mr. Wynnard Anthony is the patentee. 1500 w. Marine Engr & Nav Archt—March, 1913. No. 40460 A.

Stokers

See Mechanical Stokers, under RAILWAY ENGINEERING, Motive Power and Equipment.

Superheating

Sugden's Superheater. Illustrates and describes an improved design of sectional superheater and an improved damper arrangement. 800 w. Engng—Nov. 29, 1912. No. 38130 A.

The Regulation of Superheat Temperatures (Die Regelung der Heissdampf-temperaturen). Generich. Describes device employed at the German Babcock & Wilcox plant. Ills. 2400 w. Zeitschr des Ver deutscher Ing—Nov. 30, 1912. No. 38456 D.

The Use of Highly Superheated Steam. Gilbert E. Ryder. Shows that the ef-

Turbine Blades

iciency increases as the demands for power are increased in the operation of a superheater locomotive. 2300 w. *Ry Age Gaz*—Jan. 31, 1913. No. 39600.

Superheated Steam—Its Effect Upon Cylinder Power in Practice. Charles R. King. Gives dynamometer records of superheated and saturated steam locomotives from tests on the Italian State Railways, discussing the results. 4500 w. *Engr, Lond*—Feb. 14, 1913. Serial, 1st part. No. 40136 A.

Economy Due to Superheated Steam in Marine Practice. Walter M. McFarland. A brief discussion, with illustrative examples, of the economy which comes from the use of superheat. 1500 w. *Mech Wld*—April 4, 1913. Serial. 1st part. No. 41234 A.

Turbine Blades

Recent Tests and Experiments with Turbine-Blade Material for High Temperatures—Live Steam and Gas Turbines (Neuere Versuche und Erfahrungen mit Turbinen-schaufelmaterial für hohe Temperaturen-Heissdampf- und Gasturbinen). Herr Schulz. Tests on copper, nickel, pure iron, bronze, etc., and results. Serial. 1st part. 2400 w. *Die Turbine*—April 5, 1913. No. 42150 D.

Turbine Design

The Design of Discs (Die Berechnung der Scheibenräder). Heinrich Holzer. Formulae and their derivation in the design of high-speed steam turbine discs. Serial, 1st part. 2600 w. *Zeit f d ges Turbinwesen*—Sept. 20, 1913. No. 46069 D.

Turbine Governing

New Turbine Pendulums of the de Temple Governor Co. in Leipzig (Neue Turbinenpendel der Regulatorenbau-Gesellschaft de Temple in Leipzig). Otto Moog. New type of governors for water, steam and gas turbines, with details of theory and design. Ills. Serial. 1st part. 1800 w. *Zeit f d ges Turbinwesen*—April 20, 1913. No. 42153 D.

Turbine Plants

Steam Turbine Power Plants for Mine and Foundry Work in Westphalia, Belgium, Northern France and England (Dampfturbinenkraftanlagen auf Berg- und Hüttenwerken in Rheinland-Westfalen, Belgien, Nordfrankreich und England). K. Hoefler. General review of the plants using such systems. Ills. Serial. 1st part. 3600 w. *Zeit f d ges Turbinwesen*—Oct. 10, 1912. No. 37460 D.

Nashawena Steam Turbine Plant. Warren O. Rogers. Illustrated description of one of the most up-to-date power plants in New Bedford, Mass., for cotton

STEAM ENGINEERING

mills utilizing motor drive. 700 w. *Power*—Dec. 17, 1912. No. 38216.

Turbines

Geared Steam Turbines. Sir William H. White. From *London Times Engng. Sup.* An account of their development for ship propulsion. 2000 w. *Sci Am Sup*—Nov. 23, 1912. No. 37735.

Small Westinghouse Steam Turbine. Illustrated detailed description. 1800 w. *Power*—Dec. 10, 1912. No. 38103.

The Application of the Steam in Exhaust and Live-Exhaust Steam Turbines, Especially in Connection with the Oerlikon Double-Pressure Turbine (Die Verwertung des Dampfes in Abdampf- und Frischdampf-Abdampfturbinen mit besonderer Berücksichtigung der Oerlikon-Zweidruckturbine). J. Karrer. Charts showing economical action. 3200 w. *Zeit f d Ges Turbinwesen*—Nov. 30, 1912. No. 38460 D.

Recent Developments in Curtis Steam Turbines. R. F. Halliwell. Read before the Manchester Assn. of Engrs. Calls attention to the points in which this turbine differs from others and describes modern practice in the manufacture of the Curtis type. Ills. 2500 w. *Mech Engr*—Dec. 20, 1912. Serial. 1st part. No. 38882 A.

Large Turbo Units. J. P. Chittenden. Abstract of a paper read before the Rugby Engng. Soc. Discusses turbine efficiency and the losses in the present number. 2500 w. *Mech Engr*—Jan. 10, 1913. Serial. 1st part. No. 39253 A.

Steam Turbines of Variable Speed (Dampfturbinen mit veränderlicher Tourenzahl). Gustav Eisner. Mathematical discussion. Diagrams. Serial. 1st part. 3600 w. *Die Turbine*—Dec. 20, 1912. No. 39030 D.

Recent Developments in Steam Turbines. H. T. Herr. Gives principles and information on the recent developments in the turbine art. Ills. 6000 w. *Jour Fr Inst*—Feb., 1913. Serial, 1st part. No. 40092 D.

Recent Developments in Steam Turbines. H. T. Herr. An illustrated review of turbine development and their applications, reliability, and related information. 10500 w. *Jour Fr Inst*—March, 1913. Serial. 1st part. No. 40883 D.

The Field for Small Steam Turbines. W. J. A. London and Ashley P. Peck. Discussion of the consideration of efficiency from the commercial standpoint and the field of application where small turbines are desirable. 3000 w. *Power*—Feb. 18, 1913. No. 39893.

The Mixed Pressure Steam Turbine with Special Reference to the Use of the

Turbines

Steam Regenerator. E. D. Dickinson. Divides mixed pressure turbines into three types, outlining the conditions for which the different types are suited. 4000 w. Gen Elec Rev—Feb., 1913. No. 39614 C.

The 10,000 to 15,000 KW Rateau Steam Turbine at the New Plant of the Paris Electric Distribution Company (La turbine à vapeur système Rateau de 10,000-15,000 kw. des nouvelles usines de la Compagnie Parisienne de Distribution d'Electricité). C. Monteil. Detailed description of construction of this turbine. Ills. and plate. 12,000 w. Tech Mod—Feb. 15, 1913. No. 40067 D.

Recent Developments in Steam Turbine Practice. K. Baumann. Reviews the history of the development, compares modern types, discusses output, speeds, governing, applications, results, etc. Ills. 74 pp. Inst of Elec Engrs—March, 1913. No. 40391 N.

Steam Turbines. B. A. Strait. An elementary treatment of the principles of the impulse and reaction turbines. Ills. 4000 w. Pro U S Nav Inst—March, 1913. No. 40920 E.

The Development of the Reaction Steam Turbine. J. A. MacMurchy. Reviews the history of turbine development. Ills. 2000 w. Ap Sci—Feb., 1913. No. 40387 C.

Acadia Coal Company's Steam-Turbine Plant. Illustrates and describes a recently completed generating station for the mines at Stellarton, Nova Scotia, burning culm. 2500 w. Elec Wld—March 1, 1913. No. 40255.

Recent Developments in Turbine Reverse Buckets. O. D. H. Bentley. Describes a nozzle block designed to overcome a defect in turbines of the Riedler-Stumff type. Ills. 1500 w. Power—April 15, 1913. No. 41207.

The Application of Low Pressure Turbines. Francis Hodgkinson. Discusses points that must be considered in making such applications. Ills. 7000 w. Elec Jour—April, 1913. No. 41212.

The Commercial Testing of Large Steam Turbine Units. E. D. Williams. A summary of the equipment and procedure adopted in factory testing. 3500 w. Gen Elec Rev—May, 1913. No. 41815 C.

Condensing Plant for Steam Turbines. J. A. McLay. Read before the Assn. of Min. Elec. Engrs. Deals with plants of the surface type, briefly stating objections to other types. 3500 w. Ir & Coal Trds Rev—May 2, 1913. No. 42253 A.

Theory of the Reaction Turbine. R. L. Dougherty. Gives the theory and points

STEAM ENGINEERING

out its imperfections and limitations. 1500 w. Sib Jour of Engng—May, 1913. No. 42416 C.

Exhaust Steam and Two-Pressure Turbines (Die Abdampf- und Zweidruckturbinen). Karl Röder. Part one takes up the application, definition, construction, and general principles of exhaust utilization based on the Rateau system. Ills. Serial, 1st part. 4000 w. Zeit f d ges Turbinen—Apr. 30, 1913. No. 42154 D.

Exhaust Steam Turbines. A. Alison. Summary from a report supplied by the Jun. Inst. of Engrs. Explains the work accomplished by the heat accumulator and low-pressure turbine. 2000 w. Prac Engr—May 29, 1913. Serial. 1st part. No. 42744 A.

Small Steam Turbines. Considers the main features of some of the small turbines now on the market. Ills. 2500 w. Engr, Lond—May 30, 1913. No. 42787 A.

Steam Turbines, with Special Reference to Mining Installations. A lecture by A. L. Ohlson, before the Assn. of Min. Elec. Engrs. A discussion of economical power production. Ills. 4000 w. Ir & Coal Trds Rev—May 16, 1913. No. 42548 A.

Testing Small Steam Turbines. R. C. Allen. Illustrates and describes apparatus and method used. 2000 w. Power—June 10, 1913. No. 42731.

Modern Steam Turbines (Les turbines à vapeur modernes). C. Monteil. A study of recent types of de Laval, Parsons, Rateau and Curtis turbines. Ills. 10800 w. Tech Mod (Supplement)—May 15, 1913. No. 43066 D.

Water Brakes for the Study of Steam Turbines (Freins hydrauliques pour l'étude des turbines à vapeur). A. Rateau. A study of their application for measuring the mechanical equivalent of heat. Ills. 6800 w. Mem Soc Ing Civ de France—April, 1913. No. 43078 G.

Mixed-Pressure Steam Turbine. L. G. Hamner. Excerpt from a lecture before Melville Council No. 9, Universal Craftsmen. The advantages are given showing how exhaust steam is utilized, and how live steam can be used. 2500 w. Power—July 1, 1913. No. 43321.

The Extraction of Steam from Curtis Turbines. R. H. Rice. Illustrates and describes two mechanisms for the extraction of compressure steam from Curtis turbines. 1200 w. Gen Elec Rev—July, 1913. No. 43325 C.

The Sturtevant Steam-Turbine. Illustrated description of a turbine designed to give a reasonable steam consumption without an extravagant rate of rotation. Plate. 1500 w. Engng—July 11, 1913. No. 43900 A.

Turbines

Turbines

Exhaust Steam and Two-Stage Turbines (Ueber Abdampf- und Zweidruckturbinen). K. Röder. Extracts from a book by the author. A general description of turbines of these types. Ills. 3300 w. Elek u Masch—June 22, 1913. No. 43543 D.

Steam Requirements of Exhaust and Two-Pressure Turbines under Varying Conditions of Service (Der Dampfverbrauch der Abdampf- und Zweidruckturbinen bei den verschiedenen Betriebsverhältnissen). K. Röder. A study by curves and tables of numerous conditions. Ills. 7000 w. Zeit des Ver deutscher Ing—July 5, 1913. No. 44646 D.

The Turbines of the Mississippi River Power Co. at Keokuk, Ia. States the requirements and illustrates and describes these turbines. 2200 w. Eng News—Aug. 21, 1913. No. 44571.

The Turbine Runners of the Mississippi River Power Co. at Keokuk, Iowa. H. B. McDermid. Explains how the transportation difficulties of these large runners were overcome. Ills. 1000 w. Eng News—Aug. 21, 1913. No. 44572.

The Radial Flow Steam Turbine (Die Radialdampfturbine). Wilh. H. Eyer-mann. The construction and economical operation of this type. Serial, 1st part. 2200 w. Turbine—Aug. 5, 1913. No. 44667 D.

Improvements in Steam Turbine Construction and Present Position (Die Entwicklung des Dampfturbinenbaues und seine heutige Lage). Otto Schwarzweber. Part 1 presents a chronological summary of development. Ills. Serial, 1st part. 2200 w. Zeit f d ges Turbinenwesen—July 10, 1913. No. 44669 D.

The Efficient Maintenance of Turbine Machinery. Lieutenant Revord. Methods for ensuring economical working, and for reducing chances of breakdown. Ills. 2700 w. Shipbldr—Sept., 1913. No. 45310 C.

The Steam Friction of Turbine Wheels. William Kerr. Read before a Sci. Soc. in the Roy. Tech. College, Glasgow. An account of experimental research work. Ills. 6500 w. Engng—Aug. 22, 1913. No. 44924 A.

The Steam Friction of Turbine Wheels. William Kerr. Read before the Sci. Soc. of Glasgow Roy. Tech. College. An investigation of steam frictional losses. 3000 w. Mech Engr—Oct. 17, 1913. Serial, 1st part. No. 46231 A.

Driving Systems for Condenser Auxiliary Machinery in Steam Turbine Plants. Heinrich Treitel, in A. E. G. Jour. Gives particulars intended to serve as a guide in the selection. 2000 w. Mech Engr—Aug. 22, 1913. No. 44912 A.

STEAM ENGINEERING

Water Hammer

Condensing Plant for Steam Turbines. J. A. McLay. Deals with plants of the surface type. 2000 w. Mech Wld—Oct. 3, 1913. Serial, 1st part. No. 45855 A.

The Ljungström Radial-Flow Steam Turbine. Illustrated detailed description of a turbine of the reaction type. 1200 w. Elec Rev, Lond—Oct. 10, 1913. No. 45968 A.

See same heading, under *Hydraulic Machinery*, and under *Machine Elements and Design*; and Alternators, under *Electrical Engineering, Dynamos and Motors*. See also *Geared Turbines*, under *Marine and Naval Engineering*.

Turbine Wheels

The Deformation by Centrifugal Stress by Turbine-Wheels. Gives results of experimental investigations made by F. Samuelson. Ills. 800 w. Engng—May 9, 1913. No. 42286 A.

Valve Gear

Norberg Long Range Valve-Gear. Illustrated description of a valve-gear designed to give a long-range cut off without the customary two eccentrics, 700 w. Power—May 27, 1913. No. 42397.

Valves

Determining Reducing-Valve Sizes. J. Rowland Brown. Describes a scientific method of approximating the correct size of valve. 1000 w. Power—Sept. 23, 1913. No. 45278.

The Balancing of Piston Valves. Friedrich Becher. Shows that the assumption that the piston valve is a balanced valve is wrong. Gives a design in which the valve is balanced. Ills. 4900 w. Bul Int Ry Cong—Oct., 1913. No. 46223 G.

See same heading, under *Hydraulic Machinery*, and under *Machine Elements and Design*.

Waste Heat

The Utilization of Waste Heat from Furnaces. C. O. Bannister. Considers methods of using the waste heat, especially the preheating of air for combustion. Ills. 4500 w. Jour W of Scotland Ir & St Inst—Dec., 1912, Jan.-Feb., 1913. No. 41703 N.

A New Device for Waste-Heat Recovery. A. T. Shurick. Illustrated description of the Titlow apparatus and the operating expenses and results obtained. 1400 w. Coal Age—June 7, 1913. No. 42691.

Water-Hammer

Water-Hammer in Steam Engines (Les coups d'eau dans les machines à vapeur). F. Gyseling. A series of experiments to determine loss of efficiency. Diagrams. 3900 w. Revue Industrielle—Apr. 19, 1913. No. 42198 D.

Consult Classification of the Index. See page 9.

TRANSPORTING AND CONVEYING

Aerial Tramway

Aerial Tramways

Suspended versus Ropeways (Schwebbahnen oder feste Seilbahnen?). Hans Wettich. Discussion on the relative merits of the two systems, with examples. Serial. 1st part. 2600 w. Zeit d Oest Ing u Arch Ver—Sept. 27, 1912. No. 37435 D.

Scaling Mountain Peaks by Elevator. Illustrated description of the cable suspension railways which are working successfully in the Swiss Alps and in Tyrol. 3000 w. Sci Am Sup—March 15, 1913. No. 40637.

Lana-Vigiljoch Aerial Cableway. Illustrated description of an aerial line for the conveyance of passengers between Lana and the summit of the Vigiljoch. 1500 w. Engr, Lond—Dec. 6, 1912. No. 38251 A.

The Aerial Passenger Tramway from Lana to Vigiljoch (Le chemin de fer aérien pour voyageurs de Lana au Vigiljoch). P. Lachasse. A system in Tyrol rising to 1153 meters in a distance of 1877 meters, and the cars in use. Ills. 4200 w. Rev Industrielle—Feb. 22, 1913. No. 40581 D.

The Lana-Vigiljoch Suspended Railway (Die Schwebbahn Lana-Vigiljoch). G. Fühles. Details of an aerial tramway, for pleasure purposes, making an ascent of 1153 m. in a horizontal distance of 1.9 km. Ills. Serial. 1st part. 4900 w. Zeit des Ver deutscher Ing—May 10, 1913. No. 43011 D.

The Aerial Passenger Tramway from Lana to Vigiljoch, Tyrol (Le funiculaire aérien a voyageurs de Lana au Vigiljoch, Tyrol). Illustrated description of this novel line. Plate. 3200 w. Genie Civil—June 7, 1913. No. 43087 D.

Aerial Ropeway at Bayton Colliery. Illustrated description of a ropeway recently installed in Shropshire. 800 w. Engr—May 16, 1913. No. 42538 A.

An Italian Aerial Tramway. Illustrated description of an aerial tramway installed to transport coal from the harbor of Savona to the town of San Giuseppe. 2000 w. Coal Age—June 28, 1913. No. 43316.

The Aerial Tramway for Passenger Traffic in Rio de Janeiro (Die Seilbahn für Personenbeförderung in Rio de Janeiro). Albert Piotrowski. Describes newly constructed pleasure tramway, ascending, in two sections, the peak of the Pao de Assucar; an elevation of 1370 ft. in a distance of 5000 ft. Ills. 2300 w. Zeit des Ver deutscher Ing—June 14, 1913. No. 43528 D.

Unusual Design of Overhead Tramway.

Cableways

Illustrated description of a tramway in Utah designed for heavy tonnage. 1500 w. Eng & Min Jour—Aug. 16, 1913. No. 44423.

The New Passenger Tramway Up the Kohlererberg, near Bozen (Die neue Personenschwebbahn auf den Kohlererberg bei Bozen). Ottokar Soulay. An aerial system with coach passenger cars, operating by counterweight and motor. Ills. 2800 w. Zeit d Oest Ing u Arch Ver—Jan. 10, 1913. No. 40046 D.

The Mont Kohlerer Passenger Funicular Railway near Bozen (Le funiculaire à voyageurs du mont Kohlerer, près de Bozen). Caumont. Brief illustrated description of new line in the Austrian Tyrol. 1200 w. Genie Civil—Aug. 30, 1913. No. 45355 D.

Cable-Driven Suspended Passenger Railways (Seilbahn für Personenbeförderung). Hr. Wintermeyer. The general principles of the design of mountain hoists, cable attachments, etc. Ills. 4000 w. Elek Kraft u Bahnen—Aug. 24, 1913. No. 46086 D.

Ash Handling

Mechanical Ash Removers for Coking Plants (Maschinelle Kokslöscheinrichtung für Kokereibetriebe). Wilhelm Reubold. Describes new devices specially adapted to large plants. Ills. 2000 w. Stahl u Eisen—Oct 24, 1912. No. 37408 D.

Ash- and Coal-Handling Equipments. Henry J. Edsall. Various types of equipment are discussed and the power plants for which they are adapted. Ills. 2000 w. Coal Age—July 12, 1913. Serial, 1st part. No. 43672.

See also Cooling Towers, under *Steam Engineering*.

Buckets

Hoisting Buckets for Transporting Heavy Material (Bennes preneuses pour la manutention des matières pondéreuses) J.-E. Giraud. A general review of all varieties of dipper, hoist, rolling, orange-peel, and other buckets, in use in dredging, mining, conveying, etc. Ills. Serial, 1st part. 4500 w. Genie Civil—Feb. 8, 1913. No. 40072 D.

Cableways

A Pleasure Cableway at the Imperial Salt Mines of Berchtesgaden (Seilbahn für Vergnügungsreisende im Kgl. Salzbergwerk zu Berchtesgaden). L. Schütt. Description of ropeway and cars for the transport of visitors, and material, etc. Ills. 2200 w. Zeitschr des Ver deutscher Ing—Jan. 11, 1913. No. 40039 D.

The Surface and Underground Cable-

Consult Classification of the Index. See page 9.

Coal Handling

TRANSPORTING AND CONVEYING

Conveyors

way of the German-Luxembourg Mining and Metallurgical Company in Dortmund (Die ober- und unterirdische Seilbahn der Deutsch-Luxembourg Bergwerks- und Hütten-A. G. bei Dortmund). Herr Rath. Describes interesting tunnel arrangements for transporting ore from mine to smelter, avoiding surface obstructions. Ills. Serial. 1st part. 2800 w. Glückauf—May 10, 1913. No. 43005 D.

Coal Handling

Mechanical Handling of Coal for British Locomotives. Charles John Bowen Cooke. Abstract of a paper read before the Inst. of Civ. Engrs. describing a plant at Crewe, on the L. & N.-W. Ry. 1500 w. Mech Engr—Nov. 29, 1912. No. 38122 A.

Methods for Preventing the Formation of Coal Dust while Loading Vessels (Dispositifs réduisant la formation du poussier pendant l'embarquement du charbon dans les navires). J. E. Giraud. Describes various mechanical arrangements for eliminating coal dust. Ills. and plate. Serial. 1st part. 4800 w. Genie Civil—Dec. 7, 1912. No. 38493 D.

New Canadian Pacific Coal Handling Plant. Illustrated description of Hulett unloaders for handling coal at Fort William, Ont. 2200 w. Ir Age—Jan. 16, 1913. No. 39127 C.

Modern Coal Hoisting Plants (Neuzeitliche Kohlenförderanlagen). G. W. Koehler. Describes coal hoists, coal-car devices, coal chutes and other handling mechanism. Ills. Serial. 1st part. 2500 w. Gläser's Ann—Dec. 15, 1912. No. 39011 D.

A Retail Coal Handling Plant on the Pacific Coast. Considers the handling of a semi-bituminous coal mined at South Wellington, Vancouver Island. Also describes a briquetting plant. 1200 w. Can Engr—Jan. 30, 1913. No. 39620.

New Coal Handling Plant at Fort William, Ont., Canadian Pacific Ry. Illustrates and describes an extensive plant for unloading coal from lake boats. The plant is equipped with Hulett unloaders. 1500 w. Ry & Engng Rev—Feb. 8, 1913. No. 39752.

Coal and Ash Handling at Lake Shore Plant. A. D. Williams. Illustrated description of this feature of the plant of the Cleveland Electric Illuminating Co. 1500 w. Power—June 3, 1913. No. 42656.

Coal Transport and Loading Plant of the Soc. Anon. les Transports de Savone (Die Kohlenförder- und Stapellanlagen der Soc. Anon. les Transports de Savone). Albert Pietrowski. Description of coal carriers, silos, aerial tram-

ways, etc., in the harbors of Genoa and Savone. Ills. 3300 w. Zeit des Ver deutscher Ing—Apr. 12, 1913. No. 42137 D.

Belt Coal Conveyor at Middlesbrough. Illustrated description of an interesting type. 800 w. Engr, Lond—Sept. 26, 1913. No. 45747 A.

Recent Practice in the Construction of Coal and Ash Conveyors (Neuere Erfahrungen im Bau von Transportanlagen für Asche und Kohlen). W. Heym. Examples of recent constructions in Europe and America. 3000 w. Gläser's Ann—Sept. 15, 1913. No. 46015 D.

See also Conveyors, and Ore Handling, under *Transporting and Conveying*; and Colliers, under *MARINE AND NAVAL ENGINEERING*.

Conveyors

The Adair Face-Conveyor. Drawings and description of a coal face conveyor designed to occupy as little space as possible in the vertical direction when discharging. 2000 w. Col Guard—Nov. 22, 1912. No. 38027 A.

Apparatus for Transporting Material in the Brick Industry (Impianti per trasporto dei materiali nelle industrie ceramiche). Hubert Hermanns. Review of the various conveyors used and their practical arrangement. Ills. 2100 w. Industria—Jan. 5, 1913. No. 39098 D.

Cutting Factory Costs with Conveyor System. Illustrates and describes a gravity and power equipment installed for carrying and washing screw machine products. 1800 w. Ir Age—Feb. 6, 1913. No. 39665 C.

Experiments on the Power Requirements of Conveying Mediums (Versuche über den Kraftverbrauch von Fördermitteln). Georg von Hanffstengel. A series of power curves for belts, chains, scrapers, worm screws, bucket elevators, and others. Ills. 5500 w. Zeit des Ver deutscher Ing—March 22, 1913. No. 41462 D.

Continuous Package Conveyors for Factories. W. H. Atherton. Classifies and considers various types of package conveyors and their applications. Ills. 4500 w. Manchester Assn of Engrs—Feb. 15, 1913. No. 43295 N.

Underground Conveying. Sam Mavor. Considers the application of conveyors for handling coal, the object sought, the advantages and disadvantages, types of conveyors, mode of operation, etc. 3500 w. Col Guard—May 30, 1913. Serial. 1st part. No. 42775 A.

Mechanical Handling of Materials. Reginald Nautschold. First of a series of articles on installation, maintenance

Consult Classification of the Index. See page 9.

Cranes

TRANSPORTING AND CONVEYING

Cranes

and operation of conveying machinery. Ills. 3300 w. *Can Engr*—Aug. 21, 1913. Serial, 1st part. No. 44569.

Labor-Saving Conveyors Used in a Factory. Illustrates and describes interesting equipment, including an endless chain elevator and power and gravity carriers for handling screw machine products. 1500 w. *Ir Age*—Aug. 7, 1913. No. 44198 C.

Practicable Loading and Conveying Appliances (Fahrbare Verlade- und Fördervorrichtungen). Hub. Hermanns. A general description of conveyors, chiefly the bucket type, for use in grain and coal elevators, etc. Ills. 3000 w. *Zeit des Ver deutscher Ing*—July 5, 1913. No. 44644 D.

Portable Loading and Conveying Machinery. From an article by H. Hermanns in *Zeit des Ver Deut Ing*. Drawings and descriptions of a number of recent German constructions. 1200 w. *Ind Engng*—Sept., 1913. No. 44939 C.

See Coal Handling and Elevators, under *Transporting and Conveying*.

Cranes

Recent Crane Construction for Special Duties (Neuere Kranbauarten für Sonderzwecke). C. Michenfelder. Describes special designs for use in pickling and ice plants. Ills. 2700 w. *Zeitschr des Ver deutscher Ing*—Oct. 12, 1912. No. 37448 D.

The Shaw Electric Monorail System of Traveling Cranes. Illustrated detailed description. 800 w. *Ry & Engng Rev*—Dec. 14, 1912. No. 38226.

Electrical Equipment of Modern Mill Cranes. H. F. Stratton. Illustrates and describes the development of dynamic braking hoist controller and its application to cranes, with a discussion of the economies effected. 3000 w. *Ir Trd Rev*—Jan. 2, 1913. No. 38745 D.

Electric Cranes in Iron and Steel Works. H. H. Broughton. Deals with the design, construction and application of electric cranes. Ills. 5500 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38847 D.

The Design and Construction of Shop Cranes. Frank W. Suffield. Abstract of a paper before the Birmingham Assn. of Mech. Engrs. Deals particularly with the general design of cranes, discussing details, materials, etc. 4500 w. *Mech Engr*—Jan. 31, 1913. No. 39788 A.

Shop Cranes—Their Design and Construction. Frank W. Suffield. Abstract of paper read in Birmingham, Eng. Discusses types and details. 3500 w. *Mach, N Y*—Aug., 1913. No. 44080 C.

Crane Installation at the Società degli

Alti Forni, Fonderie ed Acciaierie di Terni (Die Krananlagen der Società degli Alti Forni, Fonderie ed Acciaierie di Terni). H. Thieme. Illustrated account of the types of overhead cranes at this Italian foundry, and their electric control. 3500 w. *Zeitschr des Ver deutscher Ing*—Jan. 18, 1913. No. 40043 D.

What the Crane Follower Should Know of Slinging and Making Hitches. John Riddell. Suggestions for the practical handling of electrical machinery. Ills. 2500 w. *Gen Elec Rev*—March, 1913. No. 40247 C.

150-Ton Crane for the Military Port at Lorient (Grue de 150 tonnes du port militaire de Lorient). R. Bazin. The main details of this revolving crane. Ills. and plate. 1600 w. *Genie Civil*—Feb. 22, 1913. No. 40595 D.

Crane Plant of an Italian Steel Works. Dr. Alfred Gradenwitz. Brief illustrated description of the more important cranes in an installation at Rome, Italy. 2500 w. *Elec Rev, Lond*—March 21, 1913. No. 40999 A.

Travelling Gentries for Bridge Erection in India. Illustrated description of the electrically-driven travelling gentries for use in the erection of fifteen spans of the Lower Ganges Bridge, Sara. 500 w. *Engng*—April 11, 1913. No. 41391 A.

Advances in the Use of Magnet Cranes (Ueber Fortschritte in der Verwendung des Lasthebemagneten). Hubert Hermanns. A review of recent improvements and applications. Ills. 2800 w. *Elek u Masch*—March 23, 1913. No. 41479 D.

Compensated Rapid Luffing-Crane with Self-Balanced Jib. Illustrated description of a crane invented by A. H. Mitchell. 700 w. *Engng*—May 9, 1913. No. 42288 A.

H. M. New Stationary Office and Stores. Illustrated description of an unusual system of building. Temporary steel gentries have been erected for carrying travelling cranes. Particulars concerning the building are also given. 1800 w. *Engr, Lond*—May 30, 1913. No. 42789 A.

The Compensating Quadrant Crane. Harry W. Brady. Aims to give a somewhat detailed description of this new crane, from both the technical and practical side. Ills. 2200 w. *Int Marine Engng*—July, 1913. No. 43421 C.

40-Ton Steam Titan Crane for East London. Illustrated description of a crane for East-London harbor, South Africa. 500 w. *Engng*—Oct. 3, 1913. No. 45861 A.

A Foundry Notable for Transporting Devices. Drawings and description of

Consult Classification of the Index. See page 9.

Dock Machinery

an unusual adaptation of the monorail and trolley crane in the new South Works of Case Threshing Machine Co., Racine, Wis. 1700 w. *Ir Age*—Oct. 9, 1913. No. 45762 C.

The Development of Magnet Cranes (Die Entwicklung von Hebenmagneten). F. Wintermeyer. General outline of the history, construction, capacity and economy of electric cranes. *Ills. Serial*, 1st part. 2700 w. *Elek Rund*—Sept. 11, 1913. No. 46071 D.

See also Tower Cranes, under Civil Engineering, *Construction*; and Regulators, under ELECTRICAL ENGINEERING, *Distribution*.

Dock Machinery

A Ship Elevator for Unloading Sacked Articles (Schiffselevator zum Ausladen von Sackwaren). Gustav Schwanda. A conveyor built by Pasckis & Paar, Vienna, for handling cement, flour, salt, coffee, and other sacked articles. *Ills. 2400 w. Zeitschr des Ver deutscher Ing*—Nov. 30, 1912. No. 38454 D.

Elevators

Innovations in Electric Elevator Construction (Neuerungen im Bau elektrischer Aufzüge). W. Feld. Discusses self-acting elevators, automatic safety catches, and other recent devices. *Ills. Serial*, 1st part. 1600 w. *Schweiz Bau*—Jan. 4, 1913. No. 40027 D.

Operating Characteristics of the Modern Passenger Elevator. E. F. Tweedy. Outlines the development of the successful types, discussing the merits and demerits of each type of drive and suspension. Also the method of determining the number and size of elevators required, using a curve chart. 5500 w. *Gen Elec Rev*—July, 1913. No. 43324 C.

Elevators: Their Uses and Abuses. B. C. Van Emon. Describes elevators for different uses, and gives information concerning them. 5400 w. *Jour Assn of Engng Soc's*—Oct., 1913. No. 46149 C.

Wet Bucket Elevator Design. Arthur O. Gates. An investigation of the mechanics, a comparison of results with present practice, and suggestions for improvements. 2500 w. *Eng & Min Jour*—Oct. 18, 1913. No. 45936.

Freight Handling

Freight Handling System for a Warehouse. Illustrated description of a telephage system for handling detachable motor truck bodies loaded with packages. 1200 w. *Eng Rec*—Dec. 28, 1912. No. 38574.

Mechanical Transferage at Railway Shops and Terminals. H. McL. Harding. Describes the application of machinery to lifting, lowering, and transferring mis-

TRANSPORTING AND CONVEYING**Ore Handling**

cellaneous articles at terminals. *Ills. 9500 w. Pro W Ry Club*—Nov. 19, 1912. No. 38624 C.

Modernized Merchandise Handling—the Result of Specialization. E. D. Levy. Deals with methods in vogue on the Frisco Railroad, describing in detail the plan of handling. Also discussion. 15000 w. *Pro St Louis Ry Club*—June 13, 1913. No. 43985.

Grain Driers

American Grain Driers (Amerikanische Getreidetrockner). J. F. Hoffmann. Illustrations and descriptions of methods employed by large American companies. 4000 w. *Zeit des Ver deutscher Ing*—May 24, 1913. No. 43013 D.

Grain Elevators

Modern Grain Storage Centers. William A. Day. Illustrates and describes the great grain elevator systems in America. 3000 w. *Cassier's Mag*—Nov., 1912. No. 38361 B.

A New Air-Suction Grain Elevator and Other Hoisting and Elevating Plants (Neue Saugluft-Getreideheber und andre Förder- und Lageranlagen). M. Buhle. Recent constructions by the G. Luther Co. in Braunschweig. *Ills. Two parts*. 1st part. 2500 w. *Zeit des Ver deutscher Ing*—March 8, 1913. No. 41458 D.

Handling System

The Handling of Material in an Implement Plant. Illustrates and describes the extensive use of the mono-rail trolley system in works at Rockford, Ill. 1800 w. *Ir Trd Rev*—May 1, 1913. No. 41794.

Hoisting Hooks

Charts for Hoisting Hooks. Axel K. Pedersen. Gives charts for checking the capacity of a hook from its dimensions. 1500 w. *Am Mach*—Dec. 26, 1912. No. 38543.

Mail Railway

A New Mail Carrying Railway. Illustrated description of a system experimentally tried out at the Paterson, N. J., plant. 1200 w. *Sci Am*—Oct. 4, 1913. No. 45613.

Electric Carrier Railways for Rapid Transfer of Mail and Express. Describes systems for the transfer of mail and light freight to distant parts of large cities. *Ills. 2500 w. Eng News*—Oct. 2, 1913. *Serial*, 1st part. No. 45647.

Ore Handling

A New Method of Handling Ore in Incline Shafts of Flat Dip. E. J. Way. Illustrated description of the conveyor system for handling the large tonnage of ore. 3500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37852 N.

Ore Unloading Plant on a Curved Dock.

Consult Classification of the Index. See page 9.

Ore Handling

Illustrates and describes the unloading machines used at the B. & O. railroad plant at Lorain, Ohio. 1800 w. *Ir Age*—Nov. 28, 1912. No. 37930 C.

Mixing, Hoisting and Charging Equipment for Handling Coal and Minerals. Describes installations for handling 900 tons of material a day. Ills. 1500 w. *Eng Rec*—Dec. 7, 1912. No. 38081.

Moving Minerals in Thin Flat Beds. Illustrates and describes swinging chutes, scraper conveyors and shaking conveyors for transporting minerals underground. 1500 w. *Mines & Min*—Jan., 1913. No. 38712 C.

Modern American Loading Stations for Ores and Coal (Neuere amerikanische Verladeanlagen für Erze und Kohlen). A. Bergman. Outline of ore-handling methods at the larger docks on the Great Lakes, New York, and Philadelphia. Ills. Serial, 1st part. 3500 w. *Zeit des Ver deutscher Ing*—Apr. 26, 1913. No. 42143 D.

The Development of Ore Unloading on the Great Lakes. J. H. Stratton. A review of methods used since 1852, illustrating and describing the unloading machines. Discussion. 5000 w. *Jour Cleveland Engng Soc*—July, 1913. No. 44039 D.

Hulett Dischargers and Their Use in Germany (Hulett-Entlader und ihre Ver-

wendbarkeit in Deutschland). Richard Borchers. Description of the Hulett crane for the unloading of ore ships or ore cars; its economy and operation in Germany. Ills. 7500 w. *Stahl u Eisen*—July 3, 1913. No. 44600 D.

See also Ore Docks, under CIVIL ENGINEERING, *Waterways and Harbors*.

Sand Handling

An Efficient Foundry Sand-Handling Plant. Illustrated description of a plant installed at Charles City, Ia. 2000 w. *Foundry*—Jan., 1913. No. 38707.

Shear-Legs

Design for the Foundation of 150-Ton Shear-Legs. Leonard Goodday. Diagrams and description of work in England for the support of hoisting tackle. 1000 w. *Can Engr*—Sept. 11, 1913. No. 45124.

Telferage

Telferage Plant at a German Electricity Works. Illustrates and describes a conveying plant at Frankfurt-on-the-Main. 1200 w. *Col Guard*—Aug. 1, 1913. No. 44315 A.

Trippers

Application of Electromagnetic Tripping Devices. George M. Meyneke. Drawings and descriptions of electrical devices which prevent damaging machines or producing defective work. 1500 w. *Mach, N Y*—Oct., 1913. No. 45602 C.

MISCELLANY

Acetylene

Acetylene Lighting. C. Hoddle. Abstract of a paper before the Ill. Engng. Soc., London. Reviews the production and uses of acetylene, its efficiency, etc. 2000 w. *Archit, Lond*—Jan. 17, 1913. No. 39454 A.

Agricultural Machinery

Development and Status in the Science of Agricultural Machinery (Entwicklung und Stand der Technik landwirtschaftlicher Maschinen). Gustav Fischer. The first number gives the history and present development of seed drilling machines. Ills. Serial, 1st part. 3600 w. *Zeit des Ver deutscher Ing*—July 26, 1913. No. 44655 D.

Cotton Mills

Recent Developments in Lancashire Cotton Mills. Illustrated discussion of advances made in the various departments. 2800 w. *Engng*—April 4, 1913. No. 41239 A.

Ethyl Alcohol

Density and Thermal Expansion of Ethyl Alcohol and of Its Mixtures with Water. N. S. Osborne, E. C. McKelvy

and H. W. Bearce. Description of experimental work and results. Bibliography of the literature. Ills. 474 pp. *Bul Bureau of Stand*—April 15, 1913. No. 43339 N.

Expositions

Machine Types and Machine Material at the Turin Exposition, 1911 (*Allgemeiner Maschinenbau und mechanische Materialbearbeitung auf der Weltausstellung Turin 1911*). Herr Hundsdoerfer. Illustrated review of the exposition. Serial. 1st part. 2000 w. *Glaser's Ann*—Oct. 15, 1912. No. 37421 D.

Flood Effects

Rehabilitation from the Dayton Flood. K. G. Martin. Illustrated account of the restoration work in the plant of the Platt Iron Works. 2000 w. *Ir Age*—May 8, 1913. No. 41906 C.

Gas

Legal Specifications for Illuminating Gas. E. B. Rosa and R. S. McBride. Gives results of experimental study of the subject of technical specifications for the quality of gas and gas service. 31

Guns

pp. Tech Papers of Bureau of Stand—No. 14. No. 43335 N.

Determination of Sulphur in Illuminating Gas. R. S. McBride and E. R. Weaver. Describes the apparatus and methods employed, giving experiments, and recommendations as to form and operation of apparatus, and determination of sulphate in the solutions. 46 pp. Tech Papers of U S Bureau of Stand, No. 20—March 7, 1913. No. 45159 N.

Guns

The Lewis Automatic Machine-Gun. G. H. Powell. Illustrated description of a gas-operated mechanism with explanation of its working. 2500 w. Engng—Nov. 8, 1912. No. 37640 A.

Ordnance Manufacture at South Bethlehem. E. G. Grace. Read before the Am. Ir. & St. Inst. Describes methods employed with 12-inch guns, armor piercing projectiles and hard-faced armor plate. 3000 w. Ir Age—Oct. 31, 1912. No. 37745 C.

Ordnance Manufacture at the Bethlehem Works. E. G. Grace. Explains how heavy artillery, projectiles, and armor plate are made, with details of the tests and descriptions of the machines. 3000 w. Ir Trd Rev—Oct. 31, 1912. No. 37182.

An American Small-Arms Plant in Australia. Brief illustrated account of a plant for manufacturing military rifles. American machine tools are in use. 700 w. Sci Am—Dec. 14, 1912. No. 38158.

Manufacturing Guns in the Iver Johnson Shop. Ethan Viall. Illustrated detailed description of how gun barrels are made from the solid bar. 1000 w. Am Mach—Feb. 20, 1913. No. 39901.

The Birth of a Rifle. Describes the work at the Commonwealth Small Arms Factory at Lithgow, N. S. W. 2500 w. Aust Min Stand—Dec. 19, 1913. No. 39764 B.

Hygiene

Mechanical and Physiological Studies on the Work of Filers (*Recherches mécaniques et physiologiques sur le travail du limeur*). Jules Amar. Analysis of the work; muscular effort; unfavorable influences of the work; rest periods, and individual variations. Ills. 10,000 w. Rev de Metall—July, 1913. No. 43559 E + F.

Photography

The Production of Motion Pictures in Factories (*Die Herstellung kinematographische Bilder in Fabriken*). G. A. Fritz. Suggestions for proper placing of cameras, and their lighting, together with possible instructive purposes of the pictures. Ills. 5500 w. Zeit des Ver

MISCELLANY

Vacuum Cleaning

deutscher Ing — March 22, 1913. No. 41463 D.

Plumbing

Plumbing in a Cincinnati Bath House. Illustrates and describes an interesting installation of shower, plunge and other fixtures. 2000 w. Met Work—March 21, 1913. No. 40763.

Printing

The Rotogravure Quick-Printing Process and Its Possibilities. Illustrates the rotogravure machine for the rapid reproduction of topical and other subjects by the photogravure press, explaining its advantages. 2500 w. Sci Am Sup—April 19, 1913. No. 41331.

Printing Machinery

The Government Printing Office at The Hague (*De Landsdrukkerij te 's-Gravenhage*). Description of new buildings by D. E. C. Knuttel, and description of mechanical installations by I. P. de Vooy. Ills. 4500 w. De Ingenieur—Feb. 1, 1913. No. 40578 D.

The Development of the Printing Press (*De ontwikkeling van de drukpers*). I. P. de Vooy. Historical review of progress in the last two centuries. Ills. 9000 w. De Ingenieur—March 1, 1913. No. 40580 D.

See also Tools, under *Machine Works and Foundries*.

Slings

Knots and Slings. F. R. Parsons. Illustrated explanation of the right and wrong way of tying knots, hitches and bindings. 1200 w. Prac Engr—Dec. 19, 1912. No. 38869 A.

Standards

Discussion on Report of the Committee on Standard Cross-Sections and Symbols. Ills. 2000 w. Jour Am Soc of Mech Engrs—April, 1913. No. 41293 D.

Tabulating Machine

The Hollerith Tabulating Machine in the Business Office. S. G. Koon. Describes a rapid means of compiling and tabulating statistics. 1200 w. Mach, N Y—Sept., 1913. No. 44842 C.

Technical Terms

The Revision and Standardization of English Technical Terms. D. M. Wright. Urges the appointment of a committee to carry on this work. 2000 w. Bul Soc for Pro of Engng Ed—June, 1913. No. 44827 N.

Vacuum Cleaning

Vacuum Cleaning. Maxwell S. Cooley. Discusses the requirements of an ideal vacuum cleaning system. 1000 w. Heat & Vent Mag—Dec., 1912. Serial. 1st part. No. 38650.

Tests of Vacuum Cleaning Systems. J. R. McColl. Gives an outline of tests

Consult Classification of the Index. See page 9.

Vacuum Evaporators

made for the Board of Education, Detroit, Mich. Curves and tabulated data. Ills. 4000 w. Jour Am Soc of Mech Engrs—Sept., 1913. No. 45417 D.

Vacuum Evaporators

Heat Transmission and Entrainment in Vacuum Evaporators. An account of a series of tests by Prof. E. W. Kerr, in which the effect of various elements was analyzed. Ills. 5000 w. Met & Chem Engng—June, 1913. No. 42608 C.

Weaving Machinery

Automatic Weaving Machinery. Edi-

MISCELLANY

torial on conditions in Lancashire and on the automatic looms and other devices now available and the possibility of adopting such mechanisms. Ills. 2000 w. Engng—May 9, 1913. No. 42290 A.

Weighing Machines

The "Aequitas" Automatic Weighing Machine (Système de bascule automatique "Aequitas"). Léon Masson. A steelyard in which the sliding counterweight is automatically operated. Ills. 2000 w. Bull Soc d'Encour—April, 1913. No. 42184 E. + F.

Weighing Machines

MINING AND METALLURGY

COAL AND COKE.....	358	MINOR MINERALS.....	428
COPPER	374	ORE DRESSING AND CONCENTRA-	
GOLD AND SILVER.....	379	TION	435
IRON AND STEEL.....	388	RARE MINERALS.....	442
LEAD AND ZINC.....	408	MISCELLANY	444
MINING	411		

Accidents

COAL AND COKE

Analysis

Accidents

Accidents from Falls of Roof and Coal. George S. Rice. Discusses causes and prevention. 5000 w. U S Bureau of Mines—Miner's Circ. 9. No. 37675 N.

Coal Mine Accidents in the United States, 1896-1912, with Monthly Statistics for 1912. Compiled by Frederick W. Horton. 74 pp. U. S. Bureau of Mines—Tech Paper 48. No. 41698 N.

Prevention of Accidents in Coal Mines John McNeil. Abstract of a paper read before the Rocky Mt. Coal Min. Inst., in which the blasting of the solid and legislation requiring payment on the run-of-mine basis is condemned. 3000 w. Coal Age—July 12, 1913. No. 43673.

Non-fatal Injuries in Bituminous Mines. F. L. Hoffman. Gives statistics of interest. 2500 w. Coal Age—Aug. 9, 1913. No. 44235.

Rufford Colliery Accident. From Mr. Walker's report on the causes of and circumstances attending the accident at Nottinghamshire on Feb. 7, 1913, from a water barrel falling down a sinking shaft. Ills. 3500 w. Col Guard—Oct. 17, 1913. No. 46235 A.

Alabama

Alabama Coal Operators' Association. William Z. Price. An account of the proceedings of the fifth annual session, with abstracts of the papers. Ills. 4500 w. Col Engr—Sept., 1913. No. 44847 C.

Alaska

A Brief Account of the Matanuska Field. W. R. Crane. Maps and illustrated description of this coal region in Alaska. 1200 w. Coal Age—April 26, 1913. No. 41546.

A "Day in Court" for the Alaska Coal Claimants. Maurice D. Leehey. A plea for justice for honest coal claimants in Alaska. 4000 w. Pro Am Min Cong—1912. No. 46181 N.

Government Construction of Railroads and Leasing of Coal Lands. Falcon Joslin. A discussion of conditions and needs

In Alaska. 8500 w. Pro Am Min Cong—1912. No. 46180 N.

Alberta

The Jasper Park Collieries. Illustrated description of new collieries in Alberta. 2500 w. Can Min Jour—Nov. 1, 1912. No. 37279.

The Burus Anthracite Mines, Sheep Creek. Sketches and report of an important property in Alberta. 1500 w. Can Min Jour—Dec. 15, 1912. No. 38354.

Analysis

Commercial Sampling of Coal. C. E. Scott. Considers precautions necessary that the sample may accurately represent the lot when selling by analyses. 3500 w. Mines & Min—Nov., 1912. No. 37187 C.

The Kaiser Wilhelm Institute at Mülheim-Ruhr for Coal Research (Das Kaiser-Wilhelm-Institut für Kohlenforschung zu Mülheim-Ruhr). The opening exercises, and the address by Dr. Emil Fischer. 4500 w. Glückauf—Nov. 16, 1912. No. 38419 D.

The Determination of Water in Coal. G. N. Huntley and J. H. Coste. Abstract of a paper read before the London Sec. of the Soc. of Chem. Ind. Considers the direct methods, gasometric, and indirect methods, and the conditions affecting them. 1600 w. Col Guard—Jan. 24, 1913. Serial, 1st part. No. 39791 A.

Coal Analysis and the Determination of Calorific Value (Ueber Kohlenanalysen und Heizwertbestimmungen). A. Wencélius. Comparative results obtained by the use of the Mahler calorimeter and the formulas of Dulong and Goutal. Discussion. 2800 w. Stahl u Eisen—Jan. 2, 1913. No. 40002 D.

The Study of Coal and Carbon Residues (Zur Kenntnis der Kohlen und Verkohlungsrückstände). Ed Donath and Er. Bräunlich. Analytical studies of coal content. 4000 w. Oest Zeit f Berg u Hütten—Feb. 22, 1913. No. 40510 D.

Consult Classification of the Index. See page 9.

Analysis

COAL AND COKE

Bituminous

Heat in the Volatile Matter of Coal. Alfred M. Peter. Abstract of a paper read before the Kentucky Min. Inst. Estimates the heat of combustion of the volatile matter in coal from that of the fixed carbon, using analyses of coals from Kentucky. 2500 w. Coal Age—May 31, 1913. No. 42625.

The Determination of Water in Coal. P. Litherland Teed. Shows that the method now employed for determining the percentage of moisture in a fuel is inaccurate, and describes an accurate and rapid process. 2500 w. Inst of Min & Met, Bul 104—May 15, 1913. No. 43155 N.

Procedure and results in Testing Fuels (Verfahren und Ergebnisse der Prüfung von Brennstoffen). F. W. Hinrichsen and S. Taczak. This first part discusses the several phases in conducting chemical tests of coal. Serial. 1st part. 4200 w. Glückauf—May 17, 1913. No. 43007 D.

Preliminary Report for the Committee on Coal Analysis of the American Society for Testing Materials and the American Chemical Society. W. A. Noyes. An account of work of sub-committees. 4500 w. Chem Engr—July, 1913. No. 43856 C.

The Earning Power of Chemistry in the Coal Mining Industry. Edmund M. Chance. Shows the economies possible in purchase of materials and sale of products. 2000 w. Col Engr—July, 1913. No. 43410 C.

Coal for Power Plants. G. Basil Barham. Discusses the differences in coals and the simple analysis necessary to determine the quality. 1500 w. Engr, Lond—Aug. 15, 1913. No. 44732 A.

The Microscopical Examination of Coal in an Impinging Light (Die mikroskopische Untersuchung der Kohle im auf fallenden Licht). H. Winter. The analysis of coal values by this method. 5000 w. Glückauf—Aug. 30, 1913. No. 45396 D.

Analysis of Coals in the United States with Descriptions of Mine and Field Samples Collected Between July 1, 1904, and June 30, 1910. N. W. Lord, with chapters by J. A. Holmes, F. M. Stanton, A. C. Fieldner, and Samuel Sanford. Part I, 321 pp. Part II, 1200 pp. U. S. Bureau of Mines. Bul. 22. No. 45963 N.

Anthracite

Facts About Anthracite Mining. E. W. Parker. Brief history of the growth of the industry showing increased economy in production. 2000 w. Mines & Min—Nov., 1912. No. 37188 C.

Geology, Mining and Preparation of Anthracite. H. H. Stoeck. An illustrated review of the field in northeastern Pennsylvania, with general discussion. 5500

w. Jour W Soc of Engrs—Oct., 1912. No. 37738 D.

Chemical Interpolation of Anthracite. M. S. Hachita. Gives a method of rapidly determining the composition. 1200 w. Mines & Min—Feb., 1913. No. 39625 C.

The Economical Use of Anthracite. Reginald Trautschold. Analysis of the various costs of different grades of anthracite coal and a study of the economies to be effected by using mixtures. 3000 w. Coal Age—July 19, 1913. No. 43814.

Mining Low Seams of Anthracite. Hugh Archbald. Discusses methods and difficulties of working thin seams with particular reference to the adaptability of machines. Ills. 2000 w. Coal Age—Oct. 25, 1913. No. 46189.

Artificial Coal

High-Temperature High-Pressure Reactions. Editorial review of the apparatus and experiments used by Dr. Friedrich Bergins, who changes peat into coal by novel methods. Ills. 3000 w. Engng—Aug. 22, 1913. No. 44922 A.

Austria

Lignite Deposits in Northwestern Bohemia between Brüx and Dux (Die Lagerungs-verhältnisse im nordwestböhmischen Braunkohlenbecken zwischen Brüx und Dux). A. Fleck. Description of geological conditions of the region. Ills. 3850 w. Glückauf—Oct. 12, 1912. No. 37409 D.

The Rositz-Zbeschau-Oslawan Coal District (Das Rositz-Zbeschau-Oslawaner Steinkohlenrevier). Otto Braun. A review of mining practice, discussing geology, and deposits. Ills. Serial. 1st part. 1800 w. Oest Zeit f Berg u Hüttenwesen—Nov. 2, 1912. No. 38412 D.

The Economic Utilization of Natural Fuels in Austria (Ueber die wirtschaftlichere Ausnützung der natürlichen Brennstoffe in Oesterreich). Ed. Donath. The consumption of anthracite and bituminous coal, peat, petroleum and wood. Serial. 1st part. 3500 w. Oest Zeit f Berg u Hütten—March 29, 1913. No. 41423 D.

Benzol

Benzol—How it is Recovered from Coal Gas. Franz Puning. Describes what is being done abroad in the recovery of this by-product. Ills. 6000 w. Ir Trd Rev—Oct. 9, 1913. No. 45783.

Bituminous

The Low Temperatures Modification of Bituminous Coals to Form a Smokeless Domestic Fuel. Presents results of recent studies at the University of Illinois, by Profs. Parr and Olin, showing that it is feasible to make a dense coke. Also

Bore Holes

editorial. Ills. 2500 w. Eng News—Dec. 26, 1912. No. 38590.

Changes in the Bituminous Coal Industry in 1912. George H. Cushing. Reviews changes and conditions explaining the tendency to solidification. 1500 w. Min & Sci Pr—Jan. 4, 1913. No. 38929 C.

Does Bituminous Mining Pay? A. E. Rickards. Presents facts and figures covering coal production and discusses the opportunity for economy. Ills. 3000 w. Coal Age—Sept. 29, 1913. No. 45247.

Bore Holes

Ten Deep Borings in East Kent. Malcolm Burr. Brief description and outline section of ten holes recently put down. 5000 w. Col Guard—Oct. 10, 1913. No. 45981 A.

Briquettes

Briquetting Coal. A description of the Shedlock system and apparatus as used in England. Ills. 2500 w. Col Engr—July, 1913. No. 43409 C.

Briquetting

Coal Washing and Briquetting. Brief illustrated description of the Alstaden Colliery Co., Ltd., at No. 2. Hibernia Mine, Germany. 2000 w. Mines & Min—Nov., 1912. No. 37186 C.

Innovations in the Practice of Drying and Briquetting Solid Fuels (Neuerungen auf dem Gebiete der Trocknung und Briquetierung fester Brennstoffe). Herr Jordan. Describes late improvements. Ills. 2500 w. Feuerungstechnik—Jan. 1, 1913. No. 40023 D.

Canada

The Production of Coal and Coke in Canada During the Calendar Year 1911. John McLeish. Advance chapter of the annual report on the mineral production of Canada. 10000 w. Can Dept of Mines—No. 200. No. 39537 N.

Notes on the Progress of Development Work in Coal Areas of Alberta and Saskatchewan. D. B. Dowling. Considers the coal areas on the Grand Trunk Pacific Ry. 2500 w. Jour Can Min Inst—Vol. XV. No. 42050 N.

The Undeveloped Coal Resources of Canada. D. B. Dowling. A review of the area and probable coal content of the various coalfields of Canada. 5000 w. Jour Can Min Inst—Vol. XIV. No. 42031 N.

Charcoal

Charcoal and Its Value in Brass and Bronze Melting. Its Manufacture and Method of Using. Ills. 2200 w. Brass Wld—July, 1913. No. 43740.

China

Coal and Iron in China (Kohle und Eisen in China). Friedrich Lux. A brief geological sketch of the country,

COAL AND COKE**Coal Dust**

describing the known appearances of these minerals. Ills. Serial. 1st part. 3800 w. Stahl u Eisen—April 3, 1913. No. 41410 D.

The Coal Industry in North China. Noah T. Williams. Abstract of a paper read before the Manchester Geol. & Min. Soc. Information concerning the Shansi coalfield, mining methods, transport, labor, etc. 5000 w. Ir & Coal Trds Rev—May 9, 1913. No. 42296 A.

Classification

Classification of Coals. J. M. Gordon. Discusses various classifications and their limitations. 2500 w. Can Min Jour—Aug. 15, 1913. No. 44492.

Cleaning

Methods and Machines for Cleaning Coal. A. Langerfeld. Describes different methods used, and gives detailed description of the Langerfeld separator and recent improvements. Ills. 4000 w. Coal Age—May 3, 1913. No. 41888.

Coal-Cutters

Installation and Manipulation of Coal-Cutters. J. McCann. Read before the Assn. of Min. Elec. Engrs. Considers the system of supply, transmission, distribution, etc. Ills. 2000 w. Ir & Coal Trds Rev—April 4, 1913. No. 41251 A.

Machine Mining in Anthracite Mines. Hugh Archbald. Illustrates and describes methods of cutting and handling the coal that renders it possible to work thin seams profitably. 4000 w. Col Engr—April, 1913. No. 40971 C.

A Coal Cutter with Saw and Auger Movement. Raleigh C. Taylor. Illustrated description of a new mining machine in which the bits are arranged spirally on a cone-shaped cutter. 2000 w. Coal Age—July 5, 1913. No. 43445.

Coal Mining Machines. Wilbert A. Miller. Reviews early coal cutters and their development, with special reference to the use of the Shortwall machines. Ills. 2500 w. Col Engr—Sept., 1913. No. 44849 C.

Coal Dust

Robbing Coal Dust of Its Dangers. Sim Reynolds. States experience in applying steam to the air current and its effect upon the dust in the mine. 3300 w. Mines & Min—Jan., 1913. No. 38711 C.

Electrical Devices for Measuring the Inflammability of Coal Dust. Information from the report of the Explosions in Mines Committee describing methods of investigation and apparatus used. Ills. 1000 w. Elec Rev, Lond—Jan. 24, 1913. No. 39772 A.

Coal Dust and Its Uses. J. Drummond Paton. Abstract of paper read before the Manchester Geol. & Min. Soc. Gives

Consult Classification of the Index. See page 9.

Coal Dust

suggestions for its profitable utilization. 4500 w. Col Guard—April 11, 1913. No. 41387 A.

The Combustion of Oxygen and Coal Dust. W. C. Blackett. Address before the N. of England Inst. of Min. & Mech. Engrs. Explains the action of oxygen, the causes, preventives, etc. General discussion. 6800 w. Col Guard—April 18, 1913. No. 41764 A.

The Slow Combustion of Coal Dust and Its Thermal Value. F. E. E. Lamplough and A. Muriel Hill. Read before the Inst. of Min. Engrs. Describes investigations to determine the nature of the chemical changes involved in the slow combustion of coal dust and the value of the heat changes accompanying the oxidation. 4000 w. Ir & Coal Trds Rev—June 6, 1913. No. 42897 A.

First Series of Coal Dust Explosion Tests in the Experimental Mine. George S. Rice, L. M. Jones, J. K. Clement and W. L. Ege. A description of the mine and equipment and an account of the object sought in its establishment, with record of first series of coal-dust tests. Ills. 113 pp. U S Bureau of Mines—Bul. 56. No. 43999 N.

Development of Coal Dust Explosions. The fourth report of the explosions in mines committee. 7000 w. Col Guard—June 20, 1913. No. 43384 A.

The French Coal Dust Experiments. formation from the last annual report concerning recent work. 2000 w. Col Guard—July 18, 1913. No. 43962 A.

How to Handle a Dry or Dusty Mine. David Victor. Gives recommendations for safety. 2500 w. Col Engr—Sept., 1913. No. 44853 C.

A Laboratory Study of the Inflammability of Coal Dust. J. C. W. Frazer, E. J. Hoffman and L. A. Scholl, Jr. Describes investigations made to find a reliable laboratory method for obtaining a classification of the dusts occurring in mines. 60 pp. U. S. Bureau of Mines—Bul 50—No. 46110 N.

The Influence of the Presence of Gas Upon the Inflammability of Coal Dust in Air. W. M. Thornton. An investigation of the influence of gas in coal-dust ignition. 2000 w. Col Guard—Sept. 19, 1913. No. 45567 A.

See also Explosions, under *Coal and Coke*, and *Fuel*, under *MECHANICAL ENGINEERING*, *Steam Engineering*.

Coalfields

A Boring for Coal at Claverly, near Bridgworth, and Its Bearing on the Extension Westwards of the South Staffordshire Coalfield. Dr. Walcot Gibson. Abstract of a paper read before the S. Staf-

COAL AND COKE

fordshire & Warwickshire Inst. of Min. Engrs. Describes the experimental boring and what it shows. Discussion. 4000 w. Ir & Coal Trds Rev—Feb. 21, 1913. No. 40321 A.

The Geology and Palaeontology of the Warwickshire Coalfield. Robert Douglass Vernon. Abstract of a paper read before the Geol. Soc. of London. A report of research work to determine the true age of the permian rocks of Warwickshire and their relationship to the carboniferous rocks, etc. 3500 w. Col Guard—March 28, 1913. Serial. 1st part. No. 41140 A.

Oil and Gas Wells Through Workable Coal Beds. George S. Rice. O. P. Hood and others. Papers discussing troubles due to proximity of gas and oil wells to coal fields. Ills. 101 pp. U S Bureau of Mines—Bul 65. No. 41215 N.

Coal Area of South as Compared with Europe. Edward W. Parker. Discusses the production and possibilities of the South's coal fields. 2000 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41553 N.

The Concealed Coalfield of Yorkshire and Nottinghamshire. Walcot Gibson. From a *Memoir* of the Geol. Survey, England and Wales. General description, with map. 2500 w. Col Guard—June 13, 1913. Serial. 1st part. No. 43143 A.

Tertiary Coal Fields of the Rio Grande. B. L. Miller. Illustrates and describes deposits in Webb County, Texas. 2500 w. Coal Age—Aug. 23, 1913. No. 44580.

The Coal Fields of Western Canada. Arthur Lakes. Describes their location, extent, geology, probable quantity, &c. Map. 2500 w. Col Engr—Aug., 1913. No. 44118 C.

The McAlester Coal Field in Oklahoma. George M. Brown. Illustrated description of this district, which yields the highest grade fuel west of the Mississippi. 1500 w. Coal Age—Aug. 2, 1913. No. 44143.

The Matanuska River Coal Field by Districts. W. R. Crane. Illustrated description of this coal field in Alaska. 2500 w. Coal Age—Aug. 2, 1913. No. 44142.

The Ipswich Coalfield. Walter E. Cameron. Map and description of the geology of the region. 2500 w. Queens Gov Min Jour—Aug. 15, 1913. No. 45173 B.

The Development of the Midland Coalfields. Fred. G. Meachem. Read before the British Assn. Reviews the history of the development. 2500 w. Col Guard—Sept. 19, 1913. No. 45565 A.

Crow's Nest Pass Coal Fields. W. W. Leach. Extracts from Guide Book, No.

Coal Formation

9, prepared by the Geol. Survey of Canada. Describes briefly the various mines. 3000 w. Can Min Jour—Oct. 1, 1913. No. 45692.

Coal Formation

Production of Coal from Cellulose at High Temperatures and Pressures. Dr. F. Bergius. From a paper read before the London Sec. of the Soc. of Chem. Ind. An account of laboratory experiments on the formation of coal. 1800 w. Ir & Coal Trds Rev—May 13, 1913. No. 42792 A.

Coal Gases

The Comparative Inflammability of Mixtures of Pit Gas and Air by Momentary Electric Arcs. W. M. Thornton. Abstract of a paper read before the N. of England Inst. of Min. & Mech. Engrs. An examination of the inflammability of samples of pit gas. 2000 w. Ir & Coal Trds Rev—Aug. 8, 1913. No. 44466 A.

The Influences of Inert Gases on Inflammable Gaseous Mixtures. J. K. Clement. A report of experiments made to determine the range of explosibility of mixtures of methane or natural gas with oxygen, carbon dioxide, and nitrogen. Ills. 24 pp. U. S. Bureau of Mines—Tech paper 43. No. 46109 N.

Coal Handling

A Modern Distribution and Storing Plant. Alfred Gradenwitz. Illustrated description of an electric telfer line in Germany. 1000 w. Coal Age—Sept. 13, 1913. No. 45112.

See Coal Handling, Conveyors, and Ore Handling, under MECHANICAL ENGINEERING, *Transporting and Conveying*.

Coal Mining

Working an Inclined Coal Bed. George Watkin Evans. Describes a method of working a pitching seam at Coal Creek mine, New Castle, Washington. Ills. 2500 w. Col Engr—Aug., 1913. No. 44119 C.

Coal Mining in the United States, with Special Reference to the Treatment of Coal Dust, and Haulage by Electric Locomotives. Samuel Dean. Abstract of paper read before the N. of England Min. & Mech. Engrs. Explains methods of working, dust-explosion phenomena, &c. 3000 w. Ir & Coal Trds Rev—Aug. 8, 1913. No. 44467 A.

Coal Preparation

Preparation of a Domestic Coal. J. D. Rogers. Methods of avoiding breakage and securing accurate sizing are discussed. Ills. 2000 w. Col Engr—March, 1913. No. 40275 C.

The Trifail Coal Dressing Plant (Ueber die Kohlenaufbereitungsanlage Trifail). Wilhelm Seltner. Details of the construction and operation of this Austrian plant. Plates. Serial. 1st part. 1400 w. Oest

COAL AND COKE

Zeit f Berg u Hütten—May 10, 1913. No. 43016 D.

Coal Purchasing

Model Specifications and Conditions of Contract for the Purchase of Coal. A copy of the model agreed upon in London in connection with guaranteed coals. 3000 w. Col Guard—April 4, 1913. No. 41238 A.

Sampling Coal Deliveries and Types of Government Specifications for the Purchase of Coal. George S. Pape. Explains the theory and method of sampling as a part of coal specifications, with related information. Ills. 66 pp. U S Bureau of Mines—Bul 63. No. 41583 N.

Economy in Purchasing and Using Coal. A. O. Doane. Arguments favoring the control of cost through purchase by specifications. 4000 w. Engineering Magazine—May, 1913. No. 42492 B.

The Purchase of Coal Under Specification. J. A. Capp. Discusses the need of purchasing under specification and means of obtaining a representative sample, etc. 4000 w. Gen Elec Rev—July, 1913. No. 43329 C.

Purchasing Coal under Specifications. George S. Pope. Abstract of paper read before the Nat. Assn. of Cotton Mfrs. Gives a summary of the advantages, discussing the award of contracts, government specifications, and sampling. 2500 w. Power—Oct. 28, 1913. No. 46215.

Coal Stacking

Coal Stacking and Coal Firing. From a paper by H. Kendrick, read before the Manchester Dist. Inst. of Gas Engrs. Deals with the effect of stacking on the physical condition of coal, the dangers, and precautions. 5000 w. Ir & Coal Trds Rev—Jan. 10, 1913. No. 39276 A.

Coal Storage

Storage of Coal Under Water. R. G. Hall. Describes a scheme worked out for storing coal for zinc smelting. Ills. 2000 w. Min & Sci Pr—March 15, 1913. No. 40722.

Storing and Rehandling Anthracite Under Cover. Wm. E. Hamilton. Gives plan, elevations and description of system of coal storage. 1200 w. Col Engr—April, 1913. No. 40977 C.

The Oxidation and Deterioration of Coal. Alvin J. Cox. An investigation of the changes which take place when coal is exposed to the air. 4500 w. Philippine Jour of Sci—Oct., 1912. No. 41705 N.

Coal Tar

Procedure in the analysis of Steel-Works Coal Tar (Ueber die Verfahren zur Untersuchung des Stahlwerksteeres). R. Weissgerber. The important steps to be

Consult Classification of the Index. See page 9.

Coal Trade

following in the preliminary examination of coking coals. 3000 w. Stahl u Eisen—Feb. 20, 1913. No. 40508 D.

The Application of Coal-Tar Oils in Foundry Practice (Die Verwendung des Steinkohlenteeröls im Giessereibetriebe). Herr Hausenfelder. The first paper discusses methods of extraction of coal-tar and its oils. Ills. Serial, 1st part. 1500 w. Giess Zeit—Oct. 1, 1913. No. 46025 D.

Coal Trade

The Panama Canal and the Coal Trade. Discusses the coaling facilities at the canal, the influence of the canal on the American and British coal markets, and Australia. 3500 w. Col Guard—May 9, 1913. No. 42285 A.

Coke

The Manufacture of Coke. William Hutton Blauvelt. Explains the coking process and gives information concerning the bee-hive and by-product ovens, methods, and matters related. 6500 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37892 F.

The Manufacture of Coke. F. E. Lucas. Deals mainly with by-product ovens, with observations on plants in Europe and America. 4500 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37893 F.

The Manufacture of Coke. Discussion of the papers of William H. Blauvelt, F. E. Lucas and C. W. Andrews, presented at the Cleveland meeting, Oct., 1912. 5500 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39453 F.

Recent Experiments on the Hardness of Coke (Neuere Untersuchungen über die Härte des Kokses). Oskar Simmersbach. Tabulated results and method of obtaining same. Discussion. 5600 w. Stahl u Eisen—March 27, 1913. No. 41409 D.

The Manufacture of Coke in Belgium. Baron Evence Coppée. Read before the Iron & Steel Inst. Reviews the development of the Coppée oven, and discusses by-product-ovens, waste heat and regenerative ovens, processes in use, and related matters. Ills. 6000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45196 A.

Coke Handling

Mechanical Coke Quenching and Loading Apparatus at the Neumühl Mines (Maschinelle Kokslösch-und-verladeeinrichtung der Zeche Neumühl). Herr Braunsteiner. Details of the construction and operation of the apparatus. Ills. 2200 w. Glückauf—April 26, 1913. No. 42119 D.

Coke-Oven Gas

Cleaning Coke-Oven Gas. Sydney F. Walker. Describes method of condensing and separating by-products. Ills. 1200

COAL AND COKE**Coke-Oven Practice**

w. Mines & Min—Feb., 1913. No. 39621 C.

Coke-Oven Gas, Utilization and Applications (Les Gaz de fours à coke, leur utilisation leurs applications). A. Goury. History, power, production; use in metallurgical furnaces, street lighting, production of nitrogen, artificial rubber, etc. Ills. 16000 w. Mem Soc Ing Civ de France—Dec., 1912. No. 40075 G.

The Decomposition Temperature of Coke-Oven Gas (Ueber die Zersetzungstemperatur von koksofengas). Oskar Simmersbach. Analytical studies. 4500 w. Stahl u Eisen—Feb. 6, 1913. No. 40505 D.

The Use of Coke-Oven Gas in an Unheated state for Steel Manufacture (Ueber die Verwendung von koksofengas in unvorgewärmten Zustände zur Stahlerzeugung). Oskar Simmersbach. The practice in use at several European and American plants, and adaptation of Siemens-Martin furnace. Ills. 2100 w. Stahl u Eisen—Feb. 13, 1913. No. 40501 D.

The Decomposition of Coke-Oven Gas and Its Employment in the Unheated Condition in Steel-Making. O. Simmersbach, in *Stahl und Eisen*. Describes the two principal methods suitable for the application of surplus coke-oven gas in the open-hearth furnace. 2500 w. Ir & Coal Trds Rev—July 18, 1913. No. 44042 A.

The Development of the Coke-Oven Gas Fan (Die Entwicklung der Kokereigas-sauger). A. Thau. A study of the lines of development since the early designs of Biele in 1848. Ills. 4200 w. Glückauf—June 7, 1913. No. 43512 D.

Direct Recovery of Tar and Ammonia from Coke-Oven Gas by the Still Process. Diagram and description of the still recovery plant at the Concordia Colliery, Oberhausen, Germany. 1000 w. Col Guard—July 25, 1912. No. 44180 A.

The Use of Stills for the Direct Extraction of Tar and Ammonia from Coke-Oven Gas (Das Verfahren von Still zur direkten Gewinnung des Teers und Ammoniaks aus Koksofengasen). F. Korten. The operation and design of the still used in the Otto direct process. Ills. 1700 w. Glückauf—July 12, 1913. No. 44615 D.

See Blast-Furnace Gas and Open-Hearth Furnaces, under *Iron and Steel*, and Gas Firing, under *MECHANICAL ENGINEERING, Steam Engineering*.

Coke-Oven Practice

Laboratory Work on By-Product Coke-Oven Plants. Gives details of tests which are frequently required, dealing

Coke Ovens

only with methods of proved efficiency. 2000 w. Gas Wld—Oct. 4, 1913. Serial, 1st part. No. 45833 A.

The Filtration of Raw Gases in Coke-Oven Practice (Ueber das Absaugen der Rohgase bei dem Koksofenbetrieb). E. Jenkner. Discusses the attending action, with outline of model arrangements. Ills. 2000 w. Stahl u Eisen—Jan 23, 1913. No. 40007 D.

Coke Ovens

Types of Coke Oven Plants as Seen in Operation. Illustrates and describes the Coppee coal washing, coking and by-product plant at Holmwood Colliery in the present article. 2500 w. Gas Wld—March 1, 1913. Serial. 1st part. No. 40458 A.

Progress in By-Product Recovery at Coke Ovens. J. E. Christopher. Abstract of paper and discussion before the Manchester Sec. of the Soc. of Chem. Ind. Briefly considers the semi-direct and the direct processes, with related matters. 3000 w. Ir & Coal Trds Rev—Feb. 28, 1913. No. 40496 A.

The Available Energy in Coke Ovens for Recovering By-Products Without the Regeneration of Heat (L'énergie disponible dans les fours à coke à récupération de sous-produits sans régénération de chaleur). Eugène Lecocq. The qualifications required for such ovens, designs, and proof. Ills. 10000 w. Rev de Metall—March, 1913. No. 40591 H.

The Coke-Oven Plant of the Indiana Steel Co. in Gary (Die Koksofenanlage der Indiana Steel Co. in Gary). H. Groeck. Illustrated description of this plant. Serial. 1st part. 2700 w. Zeit des Ver deutscher Ing—Feb. 8, 1913. No. 40536 D.

Heating Coke Ovens by Producer Gas and Blast-Furnace Gas (Le chauffage des fours à coke aux gaz de gazogènes et de hauts-fourneaux). Eugene Lecocq. The heat to be attained and methods of procedure by either process. Diagrams and tables. 18500 w. Rev de Metall—April, 1913. No. 41515 H.

The Modern By-Product Coke-Oven. C. A. Meissner. Extracts from a paper read before the Am. Ir. & St. Inst. Discusses the advantages, quality of product, and details of construction of the types best known in the United States. Ills. 7500 w. Ir Age—May 29, 1913. Serial. 1st part. No. 42558 C.

Coppée By-Product Coke-Oven Installation at Lancaster's Steam Coal Collieries, Cwmillery. Illustrated description of the washery, coke ovens and by-product plant. 2500 w. Ir & Coal Trds Rev—June 27, 1913. No. 43650 A.

COAL AND COKE**Coking By-Products**

The Production of Coke in Koppers Ovens at English Collieries. Illustrated description of by-product plants in the Cumberland district of England. 2500 w. Ir Trd Rev—July 24, 1913. No. 43865.

Recent Improvements in the Manufacture of Coke (Nouveaux perfectionnements dans la fabrication du coke). Henry Thiry. Description of new furnace types and their operation. Ills. 3200 w. Rev de Metall—July, 1913. No. 43558 E + F.

Coke Plants

See Cost Methods, under INDUSTRIAL ECONOMY.

Coking

Coking the Semi-Bituminous Johnstown Coals. John W. Gocher. An account of the trouble because they swell so freely on coking. Ills. 2500 w. Coal Age—June 14, 1913. No. 42836.

The Pishel Coking Test. Max A. Pishel. Describes a method of determining the coking or non-coking quality of a coal by its adherence to the mortar when pulverized. Ills. 3500 w. Col Engr—July, 1913. No. 43407 C.

Peat Coking (Ueber Torfverkokung). A. Wihtol. Selection of the peat, the coking process, and by-products. Ills. 2500 w. Feuerungs—Sept. 1, 1913. No. 46063 D.

Coking Appliances

Ammonia Distilling Appliances in Tar Coking (Ammoniakdestillierapparate auf Teerkokereien). A. Thau. A general review of the different types of apparatus used. Ills. Serial, 1st part. 3500 w. Gluckauf—Jan. 18, 1913. No. 40013 D.

Coking By-Products

Washing, Coking and By-Product Recovery Plant at the Old Silkstone Collieries. Illustrated detailed description. Plate. 3000 w. Ir & Coal Trds Rev—Oct. 25, 1912. No. 37295 A.

By-Product Coke. C. W. Andrews. Discusses the growth and probable future of the by-product coke industry. 1200 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39445 F.

Coking and By-Product Plant at Clifton Colliery, Cumberland. Information concerning the development of the regenerative oven in Cumberland, and illustrated description of the plant at the Clifton Colliery. 1800 w. Ir & Coal Trds Rev—Jan. 17, 1913. No. 39489 A.

Mechanical Coke Quencher. W. Reubold. Illustrated description of a new quenching device by the process of immersion. 2000 w. Ir & Coal Trds Rev—Feb. 28, 1913. No. 40494 A.

Beehive and By-Product Coke in Alabama. H. S. Geismer and David Han-

Coking By-Products

cock. A statement of the quality and quantity of coke produced in Alabama and the coal from which it is made. Ills. 1800 w. Coal Age—June 7, 1913. No. 42692.

Improving Coke from Beehive Ovens. Newell G. Alford. Suggestions for investigating the causes for the variation in quality of the product. 2000 w. Coal Age—June 7, 1913. No. 42693.

Progress in the Process of By-Product Extraction (Fortschritte auf dem Gebiete der Nebenproduktengewinnung). Dr. Runkel. Discusses recent improvements. 2800 w. Glückauf—Nov. 9, 1912. No. 38416 D.

A By-Product Plant for Foundry Coke. Illustrated description of new Koppers oven installation at Joliet, Ill. 3000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38737 D.

Recovery of By-Products in Coke Manufacture. W. E. Hartman. Discusses the application of coke oven gas as fuel for heating furnaces, and considers the value of other by-products. 2500 w. Ir Trd Rev—April 3, 1913. No. 41062.

Ammonia from the Available Nitrogen in Coal (Ueber die Nutzbarmachung des stickstoffs der Kohle in Form von Ammoniak). W. Heckel. Studies on the available nitrogen content, with outline of extraction methods. 2000 w. Glückauf—March 8, 1913. No. 41414 D.

The Advantages of Direct Ammonia Extraction Opposed to Former Indirect Methods (Die Vorzüge des direkten Ammoniak-Gewinnungsverfahrens gegenüber dem alten indirekten Verfahren). C. Heck. In this number describes the Brunk and Koppers methods. Ills. Serial. 1st part. 1800 w. Glückauf—March 22, 1913. No. 41418 D.

Advantages of the Direct Method of Ammonia Recovery. C. Heck. From Glückauf. Report to the German Coke Committee on the method of recovering sulphate of ammonia direct from coke oven gases. Ills. 2500 w. Col Guard—May 2, 1913. No. 42002 A.

Progress in By-Product Recovery at Coke Ovens. J. E. Christopher. From a paper read before the Soc. of Chem. Ind. Illustrated review of the progress made in the recovery of by-products. 2500 w. Col Guard—April 18, 1913. No. 41763 A.

The Extraction of Ammonium Sulphate by Means of the Sulphur Contained in Coke-Oven Gases (Ueber die Gewinnung von Ammoniumsulfat mit Hilfe des in den Kokereigasen enthaltenem Schwefels). J. Reichel. An explanation of the Burkheiser wet process. Ills. Serial. 1st part. 3100 w. Glückauf—Apr. 12, 1913. No. 42115 D.

COAL AND COKE

Collieries

Ammonia Stills in By-Product Coke-Oven Plants. A. Thau. Trans. from Glückauf. Illustrates and describes types of stills. 4500 w. Ir & Coal Trds Rev—June 27, 1913. Serial, 1st part. No. 43651 A.

A Contribution to the History of the Direct Recovery Process. Otto Ohnesorge. Reviews the history of the process of recovering ammonia direct from the gas and the present stage of the process. Drawing. 3000 w. Ir & Coal Trds Rev—Oct. 10, 1913. No. 45990 A.

Coking Plants

Production and Industrial Application of By-Product Coke Oven Gases. J. Becker and L. B. Robertson. Read at Chicago, before the Am. Chem. Soc. Outlines the process of distillation of coal and the treatment and application of the resulting gases. 5000 w. Chem Engr—July, 1913. No. 43859 C.

Automatic Operation of Tar Coking Plants with Especial Attention to Gas Removal (Selbsttätige Betriebsüberwachung auf Teerkokereien mit besonderer Berücksichtigung der Gasabsaugung). A. Thau. This first article considers various makes of manometers. Ills. Serial. 1st part. 3500 w. Glückauf—Oct. 19, 1912. No. 37412 D.

Waste in Coking. Guy E. Mitchell. Reports savings possible by using by-product coke ovens instead of beehive ovens. Ills. 2200 w. Col Engr—Sept., 1913. No. 44848 C.

The Recovery of Ammonia from the Gases of Distillation of Oil in Coking Plants (La récupération de l'ammoniaque du gaz de distillation de la houille dans les cokeries). M. Desmarests. The indirect and direct sulphide and simultaneous methods. Ills. 9500 w. Rev de Metall—Aug., 1913. No. 45324 H.

Study of Some New Systems of Tar Condensation from Oil Gases and of the Production of Ammonium Sulfate (Étude des nouveaux systèmes de condensation goudronneuse du gaz de houille et de production du sulfate d'ammoniaque). Charles Berthelot. Details of each system, comparisons with older methods, and advantages and faults of new methods. Ills. Serial, 1st part. 22000 w. Rev de Metall—Aug., 1913. No. 45325 H.

See also Benzol, and Coal Tar, under Coal and Coke, and Fuel, under MECHANICAL ENGINEERING, Combustion Motors.

Collieries

The Development of New Colliery Districts, with Special Reference to the Support of the Surface. Hubert Bradshaw. Abstract of a paper before the S. Staffordshire & Warwickshire Inst. of Min.

Consult Classification of the Index. See page 9.

Collieries

Engrs. Discusses questions of development of surface and sub-surface in colliery districts. 3000 w. *Ir & Coal Trds Rev*—March 14, 1913. No. 40836 A.

The Power Requirements and Installations at Anthracite Collieries. Harry M. Warren. A general description of conditions in the Lackawanna field. 1500 w. *Jour Worcester Poly Inst*—May, 1913. No. 42403 C.

Coal Washery and By-Product Coke-Oven Installation at Holmewood Colliery. Illustrated description. Plate. 1200 w. *Ir & Coal Trds Rev*—May 2, 1913. No. 42250 A.

Creating a Colliery Community in the Highlands of Kentucky. George Byrne. Illustrated account of developments near Jenkins, Ky. 3000 w. *Mfrs' Rec*—June 5, 1913. No. 42671.

A Notable Scottish Colliery. Illustrated account of a mine worked before the 13th century and now equipped with modern machinery and giving large output. 3000 w. *Col Engr*—July, 1913. No. 43406 C.

Askern Colliery. Illustrated description of a colliery showing the latest mining practice in England. Plate. 3000 w. *Ir & Coal Trds Rev*—July 18, 1913. No. 44041 A.

New Pits of the Warwickshire Coal Company, Limited. Illustrated description of the plant. 2500 w. *Ir & Coal Trds Rev*—July 11, 1913. No. 43905 A.

The Sinking and Equipping of Bedwas Colliery. Edmund L. Hann. From a paper read before the S. Wales Inst. of Engrs. An account of the sinking and layout. Ills. 5500 w. *Col Guard*—Sept. 5, 1913. No. 45151 A.

Bullcroft Main Colliery. Illustrated detailed description of this colliery near Doncaster, England. Plate. 3000 w. *Ir & Coal Trds Rev*—Oct. 17, 1913. No. 46284 A.

Culm

Burning Anthracite Culm. J. E. Parrish. Shows how improvements in boilers and grates have made it possible to utilize much waste coal, and predicting that all will eventually be utilized. Ills. 1000 w. *Coal Age*—Oct. 11, 1913. No. 45786.

Cutting Machines

Machine Mining in the South Wales Steam Coals. G. D. Budge and W. E. Jayne. From a paper read before the S. Wales Inst. of Engrs. Discusses a system of machine mining used under unfavorable conditions. Ills. 3300 w. *Col. Guard*—Sept. 26, 1913. No. 45737 A.

Electric Power

Electric Service in Coal Regions. Illustrated description of the features char-

COAL AND COKE**Electric Power**

acterizing the system of the Luzerne Co. Gas & Electric Co. of Kingston, Pa. 1200 w. *Elec Wld*—Nov. 2, 1912. No. 37280.

Notes on the Installation of Colliery Electrical Plant. F. E. Harris. Read before the N. of Eng. Br. of the Assn. of Min. Elec. Engrs. On the distribution system, control of current, earthed neutral, cables, etc. 3000 w. *Ir & Coal Trds Rev*—Dec. 6, 1912. No. 38254 A.

Application of Electric Power for Coal Mining. S. R. Stone. Discusses details of such power plants, especially the plant at Scranton, Pa. 3800 w. *Min & Engrg Wld*—Dec. 14, 1912. No. 38209.

The Electrification of a Group of Small Collieries. Campbell King. Read before the W. of Scotland Assn. of Min. Elec. Engrs. Suggestions for the applications of electric power. 2500 w. *Ir & Coal Trds Rev*—Nov. 29, 1912. No. 38137 A.

100-Horse-Power Electrically Driven Hauling Gear. Illustrated description of a hauling plant with special features, for use at collieries in India. 700 w. *Engr, Lond*—Dec. 13, 1912. No. 38532 A.

The Lancashire Electric Power Company's System and Its Application to Lancashire Collieries. Charles D. Taite. Illustrated detailed description. Discussion. Ills. 2 plates. 6500 w. *Trans Manchester Geol & Min Soc*—Feb., 1912. No. 39566 N.

Electrically Equipped Coal Mines in Nova Scotia. C. H. Wright. Illustrates and describes the application of exhaust steam turbine and pulverized fuel in the stations of the Dominion Coal Co. Operation on a 25-cycle current. 1800 w. *Elec Wld*—Feb. 1, 1913. No. 39636.

Electricity in Coal Mines. The subject is treated from the central-station point of view, and facts and figures given. Ills. 4000 w. *Elec Rev & W Elect'n*—March 1, 1913. No. 40252.

Electricity in Anthracite Mining. William Paul Jennings. Illustrated description of the anthracite under-cutter and its operation. 900 w. *Sch of Mines Qr*—Jan., 1913. No. 40762 D.

Central Station Power for Coal Mines. C. W. Beers. A discussion of the case of mine central station vs. public service corporation supply. 4000 w. *Pro Am Inst of Elec Engrs*—April, 1913. No. 41669 F.

Purchased Power in Coal Mines. H. C. Eddy. Considers the commercial aspects of purchased power vs. the isolated plant in the bituminous coalfields of Western Penn. and Eastern Ohio. 2000 w. *Pro Am Inst of Elec Engrs*—April, 1913. No. 41671 F.

Consult Classification of the Index. See page 9.

Explosions**COAL AND COKE****Firedamp**

The Electrification of Cannock Chase Colliery. S. F. Sopwith. Read before the S. Staffordshire and Warwickshire Inst. of Min. Engrs. A summary of the plant explaining the economy and advantages derived from the adoption of electric power. Ills. 1500 w. Col Guard—April 25, 1913. No. 41926 A.

See also Hydroelectric and Load Factors, under ELECTRICAL ENGINEERING, *Generating Stations*.

England

The South-Eastern Coalfield, the Associated Rocks, and the Buried Plateau. W. Boyd Dawkins. Abstract of a paper read before the Manchester Geol. & Min. Soc. Information concerning the south-eastern coalfield of England and its extension, the rocks, geology, etc. 5000 w. Ir & Coal Trds Rev—Nov. 8, 1912. No. 37651 A.

Explosions

Dust Explosions. C. M. Young. Discusses the influence of composition and fineness of dust, and the presence of gas on the liability of ignition. 3500 w. Mines & Min—Dec., 1912. No. 38007 C.

The Coal Dust Question. Samuel Dean. Shows that a "wet mine" is not necessarily a safe mine, and describes methods of applying stone dust. Ills. 2500 w. Mines & Min—Dec., 1912. No. 38004 C.

The Prevention of Coal-Dust Explosions by Rock Dust and the Results of Such Tests in English Coal Mines (Die Bekämpfung der Kohlenstaubeexplosionen durch Gesteinstaub und die Durchführung dieses Verfahrens im englischen Steinkohlenbergbau). F. Friedensburg. Methods adopted in conducting experiments. Ills. Serial. 1st part. 3000 w. Glückauf—Feb. 1, 1913. No. 40511 D.

Cincinnati Mine Explosion, Courtney, Penn. R. Dawson Hall. Illustrated account of an explosion in a mine that had been operated about 75 years. 2000 w. Coal Age—May 3, 1913. No. 41887.

Earthquake Strains and Stresses in Relation to Mine Explosions. F. Napier Denison. Brief account of work to determine the causes of coal mine explosions. 2200 w. Jour Can Min Inst—Vol. XIV. No. 42020 N.

The Influence of Incombustible Dusts on the Inflammation of Gaseous Mixtures. Third report of the Explosions in Mines Committee giving results of experiments made. 8500 w. Col Guard—April 18, 1913. Serial. 1st part. No. 41765 A.

A Record of the Origin of the Principle of Stone-Dusting for the Prevention of Colliery Explosions. W. E. Garforth. Read Before the Inst. of Min. Engrs. An

account of investigations made in connection with the danger of coal dust in mines, especially the experiments with stone dust. 6000 w. Ir & Coal Trds Rev—June 6, 1913. No. 42895 A.

The Cincinnati Mine Disaster. William Z. Price. An account of this accident near Pittsburgh, the method of mining, rescue work, and reports of the mine inspector and the Commissioners. Ills. 5000 w. Col Engr—June, 1913. No. 42613 C.

The Cadeby Main Colliery Explosion. The report of R. A. S. Redmayne to the Home Secretary on the causes of and circumstances attending the explosions which occurred July 9, 1912. Ills. 5000 w. Col Guard—May 23, 1913. Serial. 1st part. No. 42752 A.

The Cadeby Main Disaster. Abstract of the report of R. A. S. Redmayne as to the causes of and circumstances attending the explosions that occurred July 9, 1912. 4500 w. Ir & Coal Trds Rev—May 16, 1913. No. 42547 A.

The Reopening of the Norton Colliery with Self-Contained Breathing Apparatus After an Explosion. J. R. L. Allott. Abstract of a paper read before the Inst. of Min. Engrs. Explains the possible causes of the explosion and gives an account of the reopening of the pit. 6500 w. Ir & Coal Trds Rev—June 6, 1913. No. 42896 A.

The Brookside Mine Disaster. William Z. Price. An illustrated account of the accident in Schuylkill Co., Penn., the conditions and the rescue work. 2000 w. Col Engr—Sept., 1913. No. 44854 C.

The Control of Coal Dust with Various Moisture Containers against Explosions of Black Powder and Dynamite (Das Verhalten von Kohlenstaub mit verschiedenem Feuchtigkeitsgehalt gegen Schüsse von Schwarzpulver und Gurdynamit). Herr Woltersdorf. Results from a series of tests. 3000 w. Glückauf—Aug. 30, 1913. No. 45395 D.

See also Coal Dust, under *Coal and Coke*.

Firedamp

Testing for Firedamp with Wire Loop. Henry Briggs. Describes a device by which a safety lamp flame is rendered non-luminous, enabling the gas cap to be clearly seen. 2000 w. Col Engr—March, 1913. No. 40277 C.

Recent Experience on the Ignition of Firedamp by Electric Lamp Filaments. Dr. Jean Meunier. Reviews recent experiments by investigators. Ills. 2500 w. Ir & Coal Trds Rev—July 4, 1913. No. 43727 A.

Consult Classification of the Index. See page 9.

Flushing

Flushing

Flushing Anthracite Workings. Illustrates and describes methods employed in the thick and moderately thick seams of the Schuylkill region of Pennsylvania. 5600 w. Col Engr—May, 1913. No. 41829 C.

Gas Analysis

Apparatus for Gas-Analysis Laboratories at Coal Mines. George A. Burrell and Frank M. Seibert. Gives results of a study of mine atmospheres and the most efficient methods of detecting dangerous mine gases. Ills. 6500 w. U S Bureau of Mines—Tech paper 14. No. 42447 N.

Gases

On the Kinetic Theory of Gases. Sir Henry Cunynghame. A lecture to mining students giving a mathematical sketch of the Kinetic theory. 5000 w. Col Guard—May 9, 1913. Serial. 1st part. No. 42283 A.

Gas Power

Gas Power for Collieries. Sydney F. Walker. Illustrated description of a plant for using coke oven gas in large engines at a British Colliery. 2500 w. Col Engr—June, 1913. No. 42611 C.

Gas Producers

The Process in the Gas Generator on the Ground of the Second Law of Thermodynamics (Die Vorgänge im Gasgenerator auf Grund des zweiten Hauptsatzes der Thermodynamik). Kurt Neumann. A study of the chemical changes occurring in the producer. Ills. Serial. 1st part. 5500 w. Zeit des Ver deutscher Ing—Feb. 22, 1913. No. 40542 D.

Operating Cost Dependent on Furnace Practice (Betriebskosten in Abhängigkeit von der Ofenart). Dr. Volkmann. A series of two articles following the serial on the operation of distillation furnaces. This first one discusses operating costs of distillation furnaces. Serial. 1st part. 3600 w. Feuerungs—April 1, 1913. No. 41440 D.

Annular Producers for Use with Low-Grade Bituminous Fuels (Der Ringgenerator zur Erzeugung von Heiz- und Kraftgas aus minderwertigen, bituminösen Brennstoffen). J. Recktenwald. The advantages of this type and designs of furnaces for this service. Ills. 4000 w. Feuerungs—April 1, 1913. No. 41441 D.

The Gas Producer and Producer Gas. C. D. Smith. Reviews the history of the development, describing types of gas producers and of gas. Gas power plants and their management, tests, etc. Discussion. Ills. 9000 w. Jour Cleveland Engng Soc—May, 1913. No. 42431 D.

A Modification of the Jäger Method of Gas Analysis. S. H. Worrell. Descrip-

COAL AND COKE

tion of method and apparatus used. Ills. 3000 w. Met & Chem Engng—May, 1913. No. 41900 C.

The Commercial Trend of the Producer-Gas Plant in the United States. R. H. Fernald. Gives views of manufacturers of producer gas plants, the present status of such plants, views of owners and operators, and valuable data. 92 pp. U. S. Bureau of Mines—Bul 55. No. 42450 N.

Heat Balance of a Producer. Julian C. Smallwood. Gives calculations from a test of an anthracite suction-producer plant, and modifications necessary for other types. 2500 w. Power—June 24, 1913. No. 43123.

Some Perfections Produced in Gas Producers of the Siemens Type (Des perfectionnements apportés au gazogène du type Siemens). Paul Cousin. A detailed study of the Siemens producer, its operation and advantages. Ills. 2800 w. Tech Mod—May 15, 1913. No. 43067 D.

Lignite Suction-Producer Troubles. George W. Muench. A report of troubles and their remedies. 1500 w. Power—July 15, 1913. No. 43700.

Extraction of By-Products from Producer Gas (Ueber Nebenproduktengewinnung aus Generatorgas). R. Schulz. Comparative costs of operation from Mond and Zone apparatus. Diagrams. 2800 w. Stahl u Eisen—July 24, 1913. No. 44607 D.

Suction and Pressure Gas Producers, Especially for Glass Works (Saug- und Druckgasgeneratoren, insbesondere für Glashütten). E. H. Steck. Plans and arrangement of producer plants. Ills. 2000 w. Feuerungs—July 1, 1913. No. 44676 D.

The Gasification of Solid Fuels (Die Vergasung fester Brennstoffe). W. Heym. A study of available gases from the different combustibles. Ills. Serial. 1st part. 6000 w. Feuerungs—July 15, 1913. No. 44677 D.

Gas-Producer Chemistry. G. W. Muench. Information concerning the elements and compounds that concern producer work. 1500 w. Power—Sept. 23, 1913. No. 45276.

Modern Gas Producers and Coal Economy in Melting and Heating Furnaces. John A. Smeeton. Considers conditions affecting the amount of coal required per ton of steel melted, especially discussing the quality of the gas. Ills. 4000 w. Ir & Coal Trds Rev—Aug. 22, 1913. No. 44932 A.

See also Gas Engines, under MECHANICAL ENGINEERING, Combustion Motors.

Geology

Origin of Coal and Carboniferous

Consult Classification of the Index. See page 9.

Geology

Flora. A. R. Harwood. A lecture given to the Marlborough Lit. Soc. Explanation of the conditions under which coal was formed. 2000 w. Col Guard—Feb. 28, 1913. No. 40482 A.

The Genesis of Fissures in the Rhine-Westphalia Coal District (Die Entstehung der Sprünge im rheinisch-westfälischen Steinkohlengebirge). H. Quiring. A study of the geology of the region. Ills. 2600 w. Glückauf—March 29, 1913. No. 41419 D.

Geology of the Panther Creek Valley, Penn. W. B. Richards. Illustrates and Describes the geology of an important anthracite field. 3500 w. Coal Age—May 10, 1913. No. 41949.

Results of a Paleobotanical Study of the Coal-bearing Rocks of the Raton Mesa Region of Colorado and New Mexico. F. H. Knowlton. A study with the conclusion that the Raton and Denver formations are Eocene in age. 1500 w. Am. Jour. of Sci—May, 1913. No. 42424 D.

Characteristic Deposits of Coal and Eruptive Stone in the Eastern Part of the Waldenburg Field (Die Lagerungsverhältnisse des Karbons und der Eruptivgesteine im östlichen Teile des Waldenburger Beckens). G. Berg. A geological study of the porphyritic character of the district. Maps. 2800 w. Glückauf—Aug. 30, 1913. No. 45393 D.

Germany

Coal Resources in the Rhine-Westphalia Bituminous Districts (Die Kohlenvorräte des rheinisch-westfälischen Steinkohlenbezirks). Herrn Kukuk and Mintrop. A study of the geologic conditions of the region. Plate. 7500 w. Glückauf—Jan. 4, 1913. No. 40010 D.

Coal Extraction, Consumption, and Export in Germany (Kohlen-Gewinnung, -Verbrauch, und -Aussenhandel Deutschlands). Ernst Jüngst. Comparative review from 1885 to 1912. Serial. 1st part. 7000 w. Glückauf—March 8, 1913. No. 41415 D.

The Exportation of Coal from the Lower Rhine-Westphalian Coal District (Die ausfuhr von Steinkohle aus dem niederrheinisch-westfälischen Steinkohlenbezirk). Ernest Jüngst. Statistics of production and export from 1885 to 1911. 3000 w. Glückauf—June 14, 1913. No. 43515 D.

Pit Coal and Lignite Resources of the German Empire (Die Stein- und Braunkohlenvorräte des Deutschen Reiches). H. E. Böker. A study of available resources by districts. Serial, 1st part. 2000 w. Stahl u Eisen—July 10, 1913. No. 44602 D.

COAL AND COKE

Inspection

The Influence of the Ems-Weser Canal on the Coal Market (Der Einfluss des Ems-Weser-Kanals auf den Kohlenmarkt). Herr Mühlefeld. The effect of cheaper transportation throughout the region traversed by the canal. Map. 8000 w. Glückauf—July 19, 1913. No. 44618 D.

Germany's Coal Reserves. H. E. Böker, in *Glückauf*. Gives estimates compiled for presentation to the Int. Geol. Cong. at Toronto, Canada. 1200 w. Col. Guard—Aug. 22, 1913. No. 44915 A.

See also Geology, and Silesia, under *Coal and Coke*.

Gob Fires

Some Experiences of Gob Fires in Five Coalfields. James Hendrie. Read before the Nat. Assn. of Col. Mgrs. Ills. 2000 w. Ir & Coal Trds Rev—April 25, 1913. No. 41936 A.

Some Notes on Dealing with Gob Fires in Highly-Inclined Workings. Thomas Watson. Read before the Nat. Assn. of Col. Mgrs. 1000 w. Ir & Coal Trds Rev—April 25, 1913. No. 41937 A.

Great Britain

The Coal Resources of Great Britain. A. Strahan. Abstract of a chapter contributed to "The Coal Resources of the World." 8000 w. Ir & Coal Trds Rev—Sept. 19, 1913. No. 45575 A.

India

Indian Coal and Railways in 1911. F. I. Leslie Ditmas. Deals with the coal mining and railway working. 4500 w. Ir & Coal Trds Rev—Nov. 29, 1912. No. 38138 A.

Coal Mining in India. J. R. R. Wilson. Lecture to the Nat. Assn. of Col. Mgrs. (Yorkshire Branch.) Ills. 3000 w. Ir & Coal Trds Rev—Jan. 3, 1913. Serial. 1st part. No. 39174 A.

The Coal Industry of India. Sir Ralph Percy Ashton. The present number reviews the growth of the industry. 3000 w. Col Guard—Feb. 14, 1913. Serial, 1st part. No. 40126 A.

Indian Railways and the Ownership of Coal Property. Sir Ralph Percy Ashton. Brief discussion of the relations of the railways and the coal industry. 1800 w. Col Guard—March 20, 1913. No. 41013 A.

The Coalfields of India. Prof. V. Ball. Revised by R. R. Simpson. Abstracted from *Mem. of the Geol. Survey of India*. Information concerning the industry, the production, trade, labor, &c. Ills. 2500 w. Ir & Coal Trds Rev—July 25, 1913. No. 44191 A.

Inspection

Coal Mines Inspection in 1912. Digest of the reports of H. M. Inspectors of

Japan

Mines. Also editorial. Ills. 45000 w. Col Guard (Sup)—Sept. 12, 1913. No. 45297 A.

Japan

Development of the Coal Mining Industry of Japan. An illustrated account describing mining methods used in developing various properties. 2500 w. Min & Engng Wld—Dec. 28, 1912. No. 38690.

Jigs

American Jig Machinery (Amerikanische Setzmaschinen). R. Neumann and R. Blumenfeld. Illustrating and describing several types of jigs used in coal washeries. 1500 w. Zeit des Ver deutscher Ing—June 7, 1913. No. 43526 D.

Kansas

The Hamilton No. 8 Mine. L. L. Wittich. Describes the geology of the region around Arms, Kan., the coal and methods of working. Ills. 1200 w. Mines & Min—Dec., 1912. No. 38006 C.

Kentucky

The Harlan Coal Field in Kentucky. W. R. Peck and R. J. Sampson. Illustrated description of one of the subdivisions of the Cumberland Gap coalfield. 2500 w. Coal Age—May 24, 1913. No. 42385.

Legislation

New Draft General Regulations. Gives proposed regulations for mines under the Coal Mines Act, 1911. 4500 w. Col Guard—Jan. 17, 1913. Serial. 1st part. No. 39473 A.

Lignite

Lignite and Its Uses. R. O. Wynne-Roberts. Read before the Regina Engng. Soc. On the formation and quality of lignite, reports of tests, uses, and other information. 6500 w. Can Engr—Dec. 19, 1912. No. 38380.

See also Fuels, under MECHANICAL ENGINEERING, *Steam Engineering*.

Methods

Quarrying Coal at Tofield, Alberta. Joseph H. Sinclair. Illustrates and describes methods of mining coal from beds so situated that they may be stripped and loaded directly into railroad cars. 1000 w. Col Engr—June, 1913. No. 42610 C.

Mine Cave

Mine Cave Commission Report. Gives the recommendations of the Anthracite Mine Cave Commission, and the remedy suggested to meet conditions. 3500 w. Col Engr—April, 1913. No. 40974 C.

Mine Fires

Underground Fires. W. A. Taylor. Read before the East. Branch of the Scottish Inst. of Min. Engrs. Considers difficulties met with in working seams

COAL AND COKE**Mining Methods**

liable to spontaneous combustion. Ills. 2500 w. Ir & Coal Trds Rev—Feb. 28, 1913. No. 40497 A.

Mine Gases

Gases Met With in Coal Mines. Briefly discusses air, firedamp and its properties, principle of the safety lamp, detection of gas with safety lamp, and blackdamp. Ills. 2000 w. Col Engr—March, 1913. Serial. 1st part. No. 40279 C.

Ignition of Mine Gases by the Filaments of Incandescent Lamps. H. H. Clark and L. C. Isley. Detailed description of investigations to determine the degree of danger attending the use of certain sizes of incandescent lamps in atmospheres containing inflammable gas. Ills. 30 pp. U S Bureau of Mines—Bul 52. No. 41582 N.

The Influence of Inert Gases on Inflammable Gaseous Mixtures. J. K. Clement. Describes experiments made to determine the range of explosibility of mixtures of methane, or natural gas, with oxygen, carbon dioxide, and nitrogen. Ills. 3000 w. U S Bureau of Mines—Tech paper 43. No. 45298 N.

Mining

A Panel System of Coal Working. W. E. Lawrie. Explains conditions in Queensland, and advocates the adoption of the panel system for working the Aberdare seam, which is liable to fire. Ills. 3000 w. Queens Gov Min Jour—Oct. 15, 1912. No. 37631 B.

An Ideal Method of Mining. J. C. Edwards and H. M. Gibb. Plans and description of a system of mine development. 90 per cent of the coal is won by machines. 2500 w. Col Engr—July, 1913. No. 43405 C.

Mining Methods

Mining Steep Dipping Coal. A. A. Steel. Describes a method suggested to meet certain conditions in thin seams in Arkansas. 2500 w. Mines & Min—Jan., 1913. No. 38710 C.

Rearer Workings at Podmore Hall Collieries. William Barber. Read before the N. Staffordshire Inst. of Min. & Mech. Engrs. Describes the method of working, the alluvium difficulties, etc. Discussion. 3500 w. Col Guard—April 4, 1913. No. 41237 A.

Longwall Mining and Emery Pit, Dominion No. 10 Reserve, C. B. G. L. Burland. Describes the geology, mining methods, with details, and discusses advantages. Ills. 3500 w. Jour Can Min Inst—Vol. XIV. No. 42035 N.

Effect of Coal Mining on the Surface. Abstract translation of paper by M. Fayol, describing observations and experiments regarding increase of volume of

Montana

crushed material and extent and direction of movement of broken strata. 4000 w. Col Engr—May, 1913. Serial. 1st part. No. 41831 C.

Montana

The Coal Fields of Montana. Eugene Stebinger. A summary of present information from the geologist's viewpoint. 11500 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45470 F.

New Zealand

The Brown Coals of Otago. A. Gordon Macdonald. Their physical, structural and economic geology, methods of utilizing low-grade fuels and their applicability to the coals of this region. 3000 w. Col Guard—Nov. 22, 1912. Serial. 1st part. No. 38028 A.

Nova Scotia

The Coal Trade of Nova Scotia in 1912. F. W. Gray. A résumé of the year. Ills. 3000 w. Can Min Jour—Jan. 15, 1913. No. 39237.

Sections of the Sydney Coal Fields, Cape Breton, Nova Scotia. Joseph G. S. Hudson. Sections prepared to illustrate the thickness of the productive coal seams and coal measures in the different lines of the Sydney field. Tables & Maps. 2000 w. Can Dept of Mines—No. 227. No. 44491 N.

Nystagmus

Miners' Nystagmus. Reviews a lecture by Dr. T. Lister Llewellyn on this occupational disease found among coal miners. 2000 w. Ir & Coal Trds Rev—June 6, 1913. No. 42899 A.

Ohio

The Coal Fields of Ohio. Wilbur Greeley Burroughs. Map and description of the locations, extent and quality of the principal coal seams of the state. 3000 w. Col Engr—May, 1913. No. 41830 C.

Operation

Mining Plant of the Petros Coal Co. A. W. Evans. Describes the operation, with special reference to the gravity plane and the use of a five-car rotary dump. Ills. 1000 w. Col Engr—Oct., 1913. No. 45640 C.

Origin

The Origin and Deposition of Coal. W. B. Richards. Abstract of a paper read before the Panther Valley Min. Inst. A detailed summary of modern theories of the formation of coal. Ills. 2200 w. Coal Age—May 31, 1913. No. 42624.

Peat

The Utilization of Peat Fuel. Reports the investigations of the Canadian Department of Mines. Ills. 4000 w. Casier's Mag—Nov., 1912. No. 38364 B.

Canadian Studies of Peat Fuel in Gas Producers and the Elimination of Tar

COAL AND COKE**Railroad Claims**

from Producer Gas. From a report by B. F. Haanel giving a record of experiments at the fuel-testing station in Ottawa. Ills. 4500 w. Eng News—Dec. 5, 1912. No. 38066.

Peat. G. E. Brown. Information concerning the peat deposits in the United States, discussing its availability for fuel. Ills. 1200 w. Yale Sci M—Jan., 1913. No. 39504 C.

Present Position and Outlook for Peat Gasification (Heutiger Stand und Ausichten der Torfvergasung). A. Wihtol. A review of modern processes and adaptations. 3700 w. Feuerungstechnik—Jan. 1, 1913. No. 40022 D.

Investigation of the Peat Bogs and Peat Industry of Canada, 1910-1911. A. Anrep. Maps and Ills. 50 pp. Can Dept of Mines—Bul No. 8. No. 41707 N.

Pit Mining

Strip-Pit Mining in Kansas. Barry E. Scobee. Illustrated description of the open cut system of mining in this bituminous field. 1000 w. Coal Age—Oct. 25, 1913. No. 46188.

Preparation

The Preparation of Coal. Gordon Buchanan. Reviews changes introduced in Illinois during the last 35 years. Ills. 2000 w. Coal Age—May 17, 1913. No. 42206.

Preparation of Anthracite. Hugh Archbald. General discussion of present methods of cleaning and sizing hard coal. Ills. 2000 w. Coal Age—May 3, 1913. No. 41886.

Investigation on the Preparation of Fine Coal (Untersuchungen über die Aufbereitung der Feinkohlen). F. Jüngst. Theoretical and practical notes, especially covering tests of fineness. Ills. 3700 w. Glückauf—Aug. 23, 1913. No. 45386 D.

Producer Gas

See also Gas Firing, under MECHANICAL ENGINEERING, *Steam Engineering*.

Production

The Industrial Importance of Coal. Frederick W. Saward. Abstract of an interesting paper discussing the possible results of a general and abrupt cessation in production. 2500 w. Coal Age—Aug. 16, 1913. No. 44437.

Queensland

Coal Resources of Queensland. B. Dunstan. A general review. 7000 w. Queens Gov Min Jour—June 14, 1913. No. 43884 B.

Railroad Claims

Some Notes on Railroad Claims. H. B. Wolf and J. B. Nettle. Abstract of paper read before the M. O. I. Coal Assn. Comments on the difficulties the dealer is li-

Refining

able to encounter collecting damages for coal lost in transit. 2000 w. Coal Age—July 12, 1913. No. 43674.

Refining

The Refining of Coal. Reviews progress in the development of fuel values by the engineers of the experiment station of the University of Illinois. 3500 w. Cassier's—July, 1913. No. 43353.

Regulations

The New General Regulations. Analysis of the objections to the proposed regulations under the Coal Mines Act. 7500 w. Col Guard—April 11, 1913. No. 41386 A.

The New General Regulations. Regulations aiming to secure uniformity of administration of the coal mines of Great Britain to provide for safety and health of those employed. Full text. 13000 w. Col Guard—Aug. 1, 1913. No. 44316 A.

Review of 1912

The Coal Trade for 1912. Reviews by districts the British coalfields, prices, contracts, sales, etc. Also editorial. 32500 w. Col Guard—Jan. 3, 1913. Serial. 1st part. No. 39152 A.

Review of Coal Mining in the United States in 1912. Edward W. Parker. A review by states. 5000 w. Min & Engng Wld—Jan. 25, 1913. No. 39419.

The Coal and Coke Trades of the United Kingdom in 1912. General and district reviews. 16500 w. Ir & Coal Trds Rev—Jan. 3, 1913. No. 39172 A.

Royalties

Royalties as Percentages of Market Price. William Griffith. Considers that public lands should be leased for long periods or perpetually. 1000 w. Coal Age—Sept. 20, 1913. No. 45245.

Rules

Rules and Regulations to Govern the Coal Mines at Gebo, Wyo., Leased to the Owl Creek Coal Co. 3500 w. U S Bureau of Mines—May 10, 1913. No. 43292 N.

Safety Lamps

I. The Effects of Deficiency of Oxygen on the Light of a Safety Lamp. J. S. Haldane. II. Illumination of the Coal Face, with Special Reference to the Incidence of Miner's Nystagmus. T. L. Llewellyn. Two papers read and discussed together before the S. Staffordshire & Warwickshire Inst. of Min. Engrs. 7500 w. Col Guard—Oct. 25, 1912. No. 37292 A.

Sampling

Coal Sampling and Analysis. Extracts from reports issued by the South African Engng. Standards Committee with the object of standardizing methods. 3000 w. Col Guard—April 25, 1913. Serial. 1st part. No. 41927 A.

COAL AND COKE**Screening**

A Combined Screening and Picking Table. Frank E. Mueller. Illustrated description of a successful arrangement. 1000 w. Coal Age—May 3, 1913. No. 41885.

Silesia

Résumé on the Development of Mining and Metallurgy in Silesia (Uebersicht über die Entwicklung des schlesischen Berg- und Hüttenwesens). Herr Dünkelberg. An historical sketch of practice from the 12th century to the present. 3500 w. Glückauf—Aug. 30, 1913. No. 45390 D.

Geological Progress in Upper Silesia within the Past Twenty Years (Die Fortschritte der Geologie Oberschlesiens in dem letzten zwanzig Jahren). Dr. Michael. A review of the several studies made upon the various parts of the region. 2500 w. Glückauf—Aug. 30, 1913. No. 45391 D.

Upper Silesian Coal Fields in Comparison with Other Mid-European Fields in the Aspect of the Coal Flora (Das ober-schlesischen Steinkohlenbecken im Vergleich mit andern Becken Mitteleuropas auf Grund der Steinkohlenfloren). W. Gothan. A comparative study of the fossil characteristics of Mid-European coal deposits. 8000 w. Glückauf—Aug. 30, 1913. No. 45392 D.

South Africa

The Coalfields of South Africa. Rowland Gascoyne. A geological sketch, with description of the different fields. Ills. 21800 w. S African Min Jour—Sept., 1912. (Special.) No. 37874 N.

Spontaneous Combustion

The Spontaneous Combustion of Coal. Sydney F. Walker. Explains the cause of igniting and how it may be prevented. Ills. 5000 w. Gas Wld—Nov. 30, 1912. No. 38109 A.

The Absorption of Oxygen by Coal. T. F. Winmill. From a paper read before the Inst. of Min. Engrs. An account of experiments dealing with the rate of absorption of oxygen by coal dust kept at a constant temperature. 4000 w. Col Guard—Sept. 26, 1913. Serial, 1st part. No. 45736 A.

Further Researches in the Microscopical Examination of Coal, Especially in Relation to Spontaneous Combustion. James Lomax. From a paper before the Inst. of Min. Engrs. 4000 w. Col Guard—Sept. 26, 1913. No. 45738 A.

Stoppings

Why Is a Stopping? Oscar Cartlidge. Describes results of improperly built stoppings, and different methods of ef-

Subsidence

fective construction. Ills. 1200 w. Mines & Min—Nov., 1912. No. 37184 C.

Subsidence

Relation of Subsidence to Packing. George Knox. Discusses the effects and direction of operation of the forces liberated when the coal is removed in working. Ills. 2500 w. Col Engr—Sept., 1913. No. 44851 C.

Tar

The Distillation of Tar in Metallurgical Practice. Gevers-Orban. Read before the Iron & Steel Inst. Explains the importance of the tar question and describes the Cava process. Ills. 1000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45190 A.

Taxation

The Taxation of Coal Mines in Elsass-Lothringen (Die Besteuerung des Steinkohlenbergbaues in Elsass-Lothringen). H. E. Böker. Reviews taxation history. 5600 w. Glückauf—Nov. 23, 1912. No. 38421 D.

See also Laws, under *Mining*.

Tennessee

Battle Creek Mine, Tenn. William McIntyre, Jr. Illustrates and describes mining methods determined by peculiar geological conditions in this coal field. 2000 w. Mines & Min—Dec., 1912. No. 38001 C.

Testing Stations

The Government Testing Plant at Brück for Impure Air, Coal Dust, Inflammable Gases, etc. (Die staatliche Versuchsanstalt für Schlagwetter, Kohlenstaub, Brandgase usw. in Brück). Karl Stauch. The plant, its location, equipment and testing facilities. Ills. Serial, 1st part. 1200 w. Oest Zeit f Berg u Hütten—Sept. 6, 1913. No. 45375 D.

Tipples

Modern Steel-Tipple Design. John A. Garcia. Reviews developments leading to improved construction of headframe and screening plant, describing a new design. Ills. 2000 w. Coal Age—May 24, 1913. No. 42384.

Shaking Screens in a Concrete Tipple. O. G. Petersen. Illustrated description of a change in the design of shaking screens so as to adapt them to use in concrete tipples. 1200 w. Coal Age—June 21, 1913. No. 42996.

United States

Fuel Production in the United States. R. H. Byrd. Discusses the present consumption and future supply. Ills. 1200 w. Sci Am—July 5, 1913. No. 43428.

Utah

A Recent Utah Coal-Mine Development. W. R. Elliott. Illustrated description of a mining plant where the

COAL AND COKE**Weather Forecasting**

topography of the country would not permit surface haulage. 2500 w. Coal Age—July 26, 1913. No. 43919.

Valuation

Valuation of Coal Land. H. M. Chance. Appraisal methods by considering the five factors; rate of interest; royalty; quantity of coal; rate of mining, and taxes and miscellaneous expenses. 10400 w. Bull Am Inst Min Engrs—July, 1913. No. 44020 F.

Vancouver

The Geology of the Nanaimo Coal District. Charles H. Clapp. Describes this coal district of Vancouver, and its interesting geological features. Ills. 5000 w. Jour Can Min Inst—Vol. XV. No. 42049 N.

Ventilation

Common Sense Mine Ventilation. J. C. Gaskill. Discusses what constitutes good mine ventilation from the economic standpoint and how to obtain it. 4000 w. Col Engr—March, 1913. No. 40271 C.

Too Much Ventilation. W. H. Booth. Discusses the importance of the amount of moisture in the ventilating current, and the methods that have been employed for its control. 1500 w. Col Engr—March, 1913. No. 40273 C.

Coal Mine Ventilation in the Connells-ville Coke Region. Austin King. Considers the conditions existing and manner of dealing with them. 2500 w. Col Engr—March, 1913. No. 40274 C.

Stopping Ventilation at Firing Time. W. H. Reynolds and Sim Reynolds. A discussion of the dangers likely to result from such a proceeding. 3000 w. Col Engr—April, 1913. No. 40976 C.

Washery

Coal Washing Plant at a Colliery. Illustrated description of a plant installed at North Shields. 1200 w. Engr, Lond—Jan. 3, 1913. No. 39164 A.

Washery at Soddy Mine, Tennessee. Frank E. Mueller. Illustrated description of a plant for cleaning coal from different mines each containing impurities peculiar to itself. 2000 w. Mines & Min—Jan., 1913. No. 38709 C.

Economics and Principles of Coal Washing. J. B. Porter. From a monograph of the Can. Dept. of Mines, 1912—"An Investigation of the Coals of Canada." Discusses the nature of the impurities to be removed, etc. 2500 w. Queens Gov Min Jour—Jan. 15, 1913. No. 40114 B.

See Briquetting and Cleaning, under *Coal and Coke*.

Weather Forecasting

Forecasting Barometric Changes. An explanation of the methods of working

West Virginia

and how to use the information given on the daily maps of the United States Weather Bureau. Map. 1000 w. Col Engr—April, 1913. No. 40972 C.

West Virginia

The Lathrop Coal Co. J. Harvey Williams. Illustrated description of the new plant at Panther, W. Va., and the meth-

COPPER

od employed in mining. 1000 w. Mines & Min—Nov., 1912. No. 37183 C.

Yukon

The Yukon Coal Fields. D. D. Cairnes. A summary of what is known concerning the different coal fields of Yukon, emphasizing their future economic importance. Map & Ills. 9000 w. Jour Can Min Inst—Vol. XV. No. 42051 N.

British Columbia**COPPER****Africa**

The Great Copper Fields of Katanga. Information concerning this mineral belt and its metallurgical and commercial aspects. 2500 w. S African Min Jour—Sept., 1912. (Special.) No. 37864 N.

Alaska

A New Copper District. J. W. Bryant. Information concerning districts in Yukon to be opened by the proposed railway. Map. 800 w. Mining Mag—Dec., 1912. No. 38636 B.

Analysis

The Determination of Arsenic and Antimony in Converter and Electrolytic Copper. E. E. Brownson. Describes the treatment and methods as applied in the laboratory of the Boston and Montana Reduction Department, at Great Falls, Mont. 3000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44747 F.

Arctic Coast

The Coppermine Country. J. B. Tyrrell. Presents evidence of the existence of a great copper bearing area on the Arctic Coast of America, near the Coppermine River. Map. 9500 w. Jour Can Min Inst—Vol. XV. No. 42055 N.

Argentina

Copper Mining in Argentina. C. A. Tupper. An account of development work which indicates the existence of important deposits in this region. 1200 w. Eng & Min Jour—Nov. 9, 1912. No. 37368.

Arizona

Copper Production of Arizona. B. S. Butler. From advance chapter "Mineral Resources of the U. S., 1911." Reports by districts. Ills. 4500 w. Min & Sci Pr—Oct. 26, 1912. No. 37180.

The Copper Queen Mines and Works, Arizona, U. S. A. Five short papers by different authors, giving the history, geology descriptions of power plants, etc. 14000 W. Inst of Min & Met, Bul 101—Feb. 13, 1913. No. 40218 N.

Operations of the Ray Consolidated. D. C. Jackling. Annual report of this copper mine in Arizona giving a summary of the work. 3500 w. Min & Sci

Pr—May 24, 1913. No. 42512.

Progress in Mining at the Chino Mine. D. C. Jackling. Information from the annual report to the president of the Chino Copper Co. 2500 w. Min & Sci Pr—May 10, 1913. No. 42080.

The Miami Mine and Mill. J. Parke Channing. Illustrated description of the mine and mill and the working of this high-grade copper ore. 4500 w. Jour Can Min Inst—Vol. XV. No. 42039 N.

Arsenical Copper

A Method of Improving the Quality of Arsenical Copper. F. Johnson. Read before the Inst. of Metals. Describes a method of deoxidizing and conferring soundness upon cast arsenical copper. Ills. 3500 w. Engng—Sept. 5, 1913. No. 45155 A.

Assay

Electrolytic vs. Iodide Assay for Copper. P. S. Harrison. Reports a series of experiments made to determine which method would give superior results. 1600 w. Eng & Min Jour—Feb. 1, 1913. No. 39635.

Assaying

Some Recent American Progress in the Assay of Copper-Bullion. Edward Keller. Describes methods used and facts determined in the laboratory at the Raritan Copper Works, Perth Amboy, N. J. 6500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44759 F.

Bedding

Ore Bedding by the Tennessee Copper Co. H. F. Wierum. Explains the advantages gained by the bedding system. 3000 w. Eng & Min Jour—Sept. 6, 1913. No. 44989.

Blister Copper

Notes on the Occurrence of Some of the Rarer Metals in Blister Copper. A. Eilers. A brief record of recoveries made. 500 w. Bul Am Inst of Min Engrs—June, 1913. No. 43250 F.

British Columbia

Geology and Ore Deposits of Phoenix, B. C. O. E. Le Roy. Description of this copper producing district, which also yields gold and silver. 2500 w. Min & Engng Wld—Nov. 10, 1912. No. 37611.

California

Hidden Creek Copper Deposits. R. G. McConnell. From report of the Canada Dept. of Mines. Map and description of the deposits. 2500 w. Min & Sci Pr—Nov. 16, 1912. No. 37715.

California

The Trinity-Balaklala-Vulcan Mines, Shasta County, California. W. H. Storms. An account of the Shasta copper belt and the problem of smelter fumes; the geology, ore deposits, diamond-drilling and economic conditions. Ills. 3500 w. Min & Sci Pr—Sept. 13, 1913. No. 45240.

Canada

The Coppermine Country. J. B. Tyrrell. Extracts from a paper read before the Canadian Inst. Describes this country on the northern coast of North America, and the remarkably pure red copper found, giving information. Maps. 4000 w. Can Min Jour—Feb. 15, 1913. Serial, 1st part. No. 39890.

Chile

Copper Mines in Chile. Juan Blanquiere. Gives information of the country and discusses the reasons for the backward condition of most of the copper mines. 3000 w. Min & Sci Pr—March 29, 1913. Serial. 1st part. No. 41048.

Concentration

The Great Falls System of Concentration. Albert E. Wiggin. Gives a brief history of the Great Falls concentrator and the various concentrating machines and systems which have been tested in a search for a flow sheet that would give a high recovery of copper. Ills. 9500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44752 F.

A Metallurgical Problem. F. W. Trap-hagen. Explains methods of calculation in concentration and reverberatory smelting of a second-class copper ore. 2500 w. Met & Chem Engng—Sept., 1913. No. 44969 C.

See also Slimes, under *Copper*.

Converters

Development of the Basic-Lined Converter for Copper Mattes. E. P. Mathewson. Brief review of the development of the process and statement of its advantages. Ills. 1000 w. Bul Am Inst of Min Engrs—June, 1913. No. 43254 F.

Great Falls Converter Practice. Archer E. Wheeler and Milo W. Krejci. Reviews the history of copper converting at this plant. 13000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44753 F.

Development of Converter Practice. Herbert Haas. Reviews the essential features in the development of the copper converter. 2500 w. Min & Sci Pr—Oct. 25, 1913. No. 46380.

COPPER

Flue Dust

Copper Extraction

The Sulphatizing Roasting of Copper-Ores and Concentrates. Utley Wedge. Facts relating to only one step in the wet process of copper extraction, dealing only with the formation of copper-sulphate by roasting copper-ores or concentrates. 2000 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38374 F.

Copper-Slags

The Constitution and Melting-Points of a Series of Copper-Slags. Charles H. Fulton. Gives the result of an investigation of reverberatory-furnace slags made to determine the influence of change in composition on the melting point. Ills. 8000 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38370 F.

Cost

The Cost of Copper. An inquiry into the cost of the output of copper of the great American producers and to the consumer. 8800 w. Eng & Min Jour—Aug. 9, 1913. No. 44247.

Deoxidation

Copper Deoxidation by Means of Magnesium. Dr. Friedrich Hüser. Trans. from *Metall und Erz*. A report of comparative experiments with different reducing agents showing that the best quality of copper was obtained when using magnesium. Ills. 1600 w. Met & Chem Engng—Sept., 1913. No. 44972 C.

Drilling

Blast-Hole Drilling in Open-Pit Copper Mining. W. R. Brown. Information concerning mining methods at Copper Flat, Nevada. 2500 w. Min & Engng Wld—Oct. 25, 1913. No. 46217.

Electric Power

Electric Power on the Michigan Copper Range. George E. Edwards. Describes the equipment and distribution of high-tension current; applications to lighting, mine pumping, hoists, etc. Ills. 1500 w. Min & Engng Wld—March 1, 1913. No. 40297.

Electrolytic Refining

Notes on the Electrolytic Refining of Copper Precipitate Anodes. W. F. Burns. Tests at the Great Falls Works, Butte, and conclusions reached, showing that cathodes may be economically produced. 1700 w. Bull Am Inst Min Engrs—July, 1913. No. 44008 F.

Flue Dust

Arsenic Trioxide from Flue Dust. James O. Elton. A study of actual operation at Washoe smelter, with results of a visit to the Midvale plant, near Salt Lake, and an account of laboratory work. 4000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44748 F.

Consult Classification of the Index. See page 9.

Flue Gases

Flue Gases

Determination of Gases in Smelter Flues; and Notes on the Determination of Dust Losses at the Washoe Reduction Works, Anaconda, Mont. Edgar M. Dunn. Describes the methods and apparatus used and considers other methods. Ills. 13000 w. *Bul Am Inst of Min Engrs*—Aug., 1913. No. 44758 F.

Fumes

Mammoth System of Fume Control. Al. H. Martin. Illustrates and describes the bag house and apparatus at Mammoth Copper Co. smelter that operates successfully in a farming region. 800 w. *Mines & Min*—Jan., 1912. No. 38713 C.

The Heslewood Method of Fume Control. A. H. Martin. Describes this new process evolved in California for smelting copper ores and control of noxious fumes. 1500 w. *Min & Engrng Wld*—May 3, 1913. No. 41878.

Geology

Disseminated Replacement Copper Deposits. C. W. Botsford. Explains the conditions necessary for the formation of a replacement. 2500 w. *Eng & Min Jour*—March 22, 1913. No. 40757.

Pure Copper and Some Copper Minerals in Company with Zeolite in Andesite Rock near Rgoste, East Serbia (Ueber gediegenen Kupfer und einige Kupferminerale als Begleiter der Zeolithe aus den Andesitgesteinen bei Rgoste in Ost-Serbien). M. Lazarevic. A petrographic study. Diagram. Serial. 1st part. 1800 w. *Oest Zeit f Berg u Hütten*—April 5, 1913. No. 41439 D.

Origin of the Butte Chalcocite. Gives evidence supporting the belief of primary origin. 2000 w. *Eng & Min Jour*—Sept. 6, 1913. No. 44990.

Great Falls

See Concentration, Converters, Refining, and Smelter Flues, under *Copper*.

Lake Superior

Notes on Lake Superior Copper Mines. A résumé of recent developments at some of the mines immediately prior to the strike. Ills. 2000 w. *Eng & Min Jour*—Aug. 16, 1913. No. 44425.

Leaching

The Leaching of Copper Ores. John Rooke-Cowell. A discussion of methods used and their advantages. 2000 w. *Min & Sci Pr*—Aug. 23, 1913. No. 44800.

Copper Leaching at Butte, Montana. Peter E. Peterson. Describes the general scheme of operations. 1600 w. *Min & Engrng Wld*—Sept. 6, 1913. No. 44937.

Bullwhacker Leaching Plant, Butte, Mont. Peter E. Peterson. Describes the plant, the ore flow sheet, and other details. 1500 w. *Min & Engrng Wld*—Oct. 1, 1913. No. 45674.

COPPER

Montana

Low-Grade Ores

The Utilization of Copper Ores. Deficient in Copper, but Rich in Silicic Acid, Chalk and Magnesia (Die Verwertung kupferarmer, kieselsäurereicher, Kalk und Magnesia enthaltender kupfererze). Frd. Freise. Analysis of such ores and their value. Serial, 1st part. 3500 w. *Oest Zeit f Berg u Hüttenwesen*—Jan. 11, 1913. No. 40017 D.

Metallography

Notes on the Metallography of Refined Copper. Earl S. Bardwell. Apparatus and studies made for determining oxygen content of charges in the refining furnaces of the Boston & Montana Reduction Plant. Ills. 3000 w. *Bull Am Inst Min Engrs*—July, 1913. No. 44024 F.

Metallurgy

The Temperature of Certain Operations in the Metallurgy of Copper and Lead. G. Howell Clevenger. Gives data determined in a number of furnaces. Ills. 1200 w. *Met & Chem Engrng*—Aug., 1913. No. 44096 C.

Progress of Copper Metallurgy. Thomas T. Read. Discusses progress in the smelter fume situation, new construction, reverberatory practice, blast-furnace practice, etc. Ills. 3500 w. *Min & Sci Pr*—Jan. 4, 1913. (Special.) No. 38930 C.

Mexico

Work of the Cananea Copper Company. L. D. Ricketts. Information from a report for the year 1911. 2500 w. *Min & Sci Pr*—Nov. 2, 1912. No. 37311.

Relation of Outcrops to Ore at Cananea. Morris J. Elsing. Discusses the great variety of copper deposits at Cananea, and the indications. Ills. 4500 w. *Eng & Min Jour*—Feb. 15, 1913. No. 39871.

See also same heading, under *Gold and Silver*.

Michigan

Methods of Prospecting and Developing Deposits in Michigan. R. E. Hore. Describes prospecting and mining in the copper country. 5000 w. *Can Min Jour*—Jan. 1, 1913. No. 38917.

Review of the Michigan Copper Industry in 1912. Reginald E. Hore. Abstract of a report written for the State Geological Survey. 1800 w. *Min & Engrng Wld* Feb. 8, 1913. No. 39741.

The Champion Mine, Houghton, Mich. Edward Futterer. Describes this copper mine and the peculiar underground methods in use, with other information of interest. Ills. 3000 w. *Jour Can Min Inst*—Vol. XV. No. 42063 N.

Montana

Geology of the Copper Mines of Butte, Montana. Walter Harvey Weed. Map

Consult Classification of the Index. See page 9.

Montana

COPPER

Refining

and description of the vein systems, secondary enrichment, etc. 1700 w. Min & Engng Wld—Jan. 18, 1913. No. 39233.

The Year's Improvement and Progress at Anaconda. B. B. Thayer. From the report of the Anaconda Copper Mining Co. for 1912. 2500 w. Min & Sci Pr—May 31, 1913. No. 42620.

The Newer Developments at Butte Mines. Claude T. Rice. Describes especially the changes due to recent discoveries. Butte is greatest producer of copper in the world, and one of the largest silver producers. Map. 6500 w. Min & Engng Wld—July 19, 1913. No. 43793.

Recent Advances in Butte Mining Practice. Claude T. Rice. An account of improvements introduced, changes in practice, etc. 6500 w. Min & Engng Wld—July 26, 1913. No. 43939.

Mineral Associations at Butte, Mont. D. C. Bard and M. H. Gidel. Notes based on the megascopic study of 2400 specimens of minerals and ores from the Butte mines, combined with field observations. 1800 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44751 F.

Ore Deposits at Butte, Mont. Reno H. Sales. A study of the geology of this district where ore deposits are rich and extend to great depths. Copper, silver, gold, and zinc are produced. Ills. 44500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44750 F.

See also Flue Dust, and Flue Gases, under Copper.

Nevada

Work of the Nevada Consolidated. Pope Yeatman. Information from the annual report to the directors of the Nevada Consolidated Copper Co. 2000 w. Min & Sci Pr—May 3, 1913. No. 41939.

See same heading, under Gold and Silver.

New Mexico

Sandstone Copper Deposits at Bent, New Mexico. Sydney H. Ball. Notes on the property of the Tularosa Copper Co. describing the geology, structure, etc., and discussing the genesis of the ores. Ills. 4500 w. Min & Sci Pr—July 26, 1913. No. 44097.

Nickel-Copper

Sudbury Nickel-Copper Industry. Reginald E. Hore. Information concerning the extent of the deposits, methods of mining the ore, heap roasting, and smelting to matte. Ills. 1300 w. Mines & Min—Feb., 1913. No. 39626 C.

Magmatic Origin of Sudbury Nickel-Copper Deposits. Reginald E. Hore. A study of the processes involved in the solidification of the magma, and the rela-

tionship between the ore deposits and furnace products, showing how these facts are in accord with the theory of origin. 3000 w. Qr Bul of Can Min Inst—March, 1913. No. 41601 N.

Magmatic Origin of Sudbury Nickel-Copper Deposits. Calls attention to some of the processes involved in the solidification of the nickel-bearing eruptive, stating the peculiar relationships which Mr. David H. Browne has found to exist between the ore deposits and furnace products, etc. 3300 w. Can Min Jour—July 15, 1913. No. 43823.

Nickel-Copper Ore

Sorting, Roasting and Smelting Nickel-Copper Ore, Canadian Copper Company. Illustrated detailed description of methods used at the mines of this company. 1500 w. Can Min Jour—Aug. 1, 1913. No. 44206.

Ore Deposits

Gossan Outcrops of Cupriferous Pyrite. H. W. Turner. Describes indications of copper deposits, effects of weathering, illustrating examples in the Ural region. Ills. 2200 w. Min Mag—Nov., 1912. No. 37905 B.

Native Copper Deposits. Alfred C. Lane. Considers the characteristics of these deposits, and how they were deposited. Discussion. 3000 w. Jour Can Min Inst—Vol. XIV. No. 42030 N.

Precipitation

The Precipitation of Copper from the Mine Waters of the Butte District. J. C. Febles. History and principles of precipitation method, and description of the High Ore plant. Ills. 6000 w. Bull Am Inst Min Engrs—July, 1913. No. 44017 F.

Pyrrhotite

The Relation of Pyrrhotite to Chalcopyrite and Other Sulphides. Arthur P. Thompson. Gives results of a study of specimens from localities on the Atlantic seaboard, with conclusions. Ills. 3500 w. Sch of Mines Qr—July, 1913. No. 43739 D.

Reduction

Chemistry in the Reduction Processes in Use at Anaconda, Mont. Frederick Laist. A discussion of the reactions going on between the minerals and compounds in the various furnaces. 3500 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39452 F.

Refining

Notes on the Great Falls Electrolytic Plant. Willis T. Burms. A record of a refinery that has for 17 years been operating under conditions not to be found in any similar plant. Ills. 9500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44757 F.

Reverberating Furnace

COPPER

Smelting

Reverberatory Furnace

The Development of the Reverberatory Furnace for Smelting Copper Ores. E. P. Mathewson. Reviews the development and gives the effect of lengthening the reverberatory furnace at the Washoe smelter, Anaconda, Mont. Ills. 2500 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39451 F.

Reviews of 1912

I. The World's Copper Production and Consumption. II. Copper Production in the United States in 1912. General reviews of the past year. 4000 w. Min & Engng Wld—Jan. 25, 1913. No. 39416.

The Copper Industry in 1912. Reviews the production and markets, the conditions in the various mining districts and gives related information. 7000 w. Eng & Min Jour—Jan. 11, 1913. No. 38981.

The Metallurgy of Copper in 1912. Arthur L. Walker. An account of new smelteries and new processes placed in service during the past year. 1500 w. Eng & Min Jour—Jan. 11, 1913. No. 38988.

Roasters

Increasing the Efficiency of MacDougall Roasters at the Great Falls Smelter of the Anaconda Copper Mining Co. Frank R. Corwin and Selden S. Rodgers. A description of extensive tests and investigations resulting in the final doubling of the roaster capacity. Ills. 13400 w. Bull Am Inst Min Engrs—July, 1913. No. 44023 F.

Rock House

Rock House of Quincy Mining Co. T. C. Desoller. Describes methods used in hoisting, dumping, handling and cleaning rock and copper ore at No. 2 mine, Lake Superior. 1700 w. Mines & Min—Jan., 1913. No. 38714 C.

Russia

Copper Mines of the Caucasus. E. de Hautpick. A short description of the different mines. 2000 w. Min Jour—Jan. 11, 1913. No. 39252 A.

Copper Metallurgy at Keda in Caucasia (Die Kupferhütte zu Kedabeg im Kaukasus). Herrn Golowatschew, and Lange. The furnaces and general practice in the Russian peninsula. Ills. 3500 w. Glückauf—May 10, 1913. No. 43006 D.

Slimes

Concentration of Slimes at Anaconda, Mont. Ralph Hayden. Shows what efforts have been made to solve the slime problem in the concentrator of the Washoe Reduction Works, where the copper sulphide ores from Butte are treated. Ills. 5500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44744 F.

Smelter Flues

The Great Falls Flue System and Chimney. C. W. Goodale and J. H. Klepinger. Describes the new flue system, which cost about \$1,100,000, and includes the largest and highest chimney in the world and other interesting features. Ills. 14500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44756 F.

Smelter Fumes

Neutralization of Smelter Gases. George C. Westby. From *Jour. of Ind. & Engng. Chem.* Gives results of methods with which the writer has experimented. 2500 w. Min & Sci Pr—Oct. 26, 1912. No. 37179.

Smelting

Development of the Reverberatory Copper Smelting Furnace. E. P. Mathewson. Read before the Int. Cong. of Ap. Chem. Gives the history and record of the work. Ills. 2500 w. Min & Sci Pr—Nov. 9, 1912. No. 37560.

Fink Smelting Furnace for Copper, Lead and Zinc. Edward Fink. Illustrated description of a new smelting furnace and report of its development. 4000 w. Min & Engng Wld—Nov. 2, 1912. No. 37266.

Copper Smelting Methods at Bogoslawsk, Peron, Russia. Richard Davey. Describes the nature of the ores, water-jackets, matte, Bessemerizing the power plant, and other items of interest. 1500 w. Inst of Min & Met, Bul 101—Feb. 13, 1913. No. 40219 N.

The Copper Smelting of the U. S. Metals Refining Co. Richard H. Vail. The smelting-plant at Chrome, N. J., is illustrated and described, and information given concerning its operation. 2500 w. Eng & Min Jour—May 24, 1913. No. 42381.

Copper Smelting Operations of the Santa Fé Gold and Copper Mining Co. Clarence T. Emrich. Illustrated description of the smelting plant near San Pedro, N. Mex., and its operations. 2000 w. Met & Chem Engng—June, 1913. No. 42606 C.

The Kedabeg Copper-Smelting Works. Illustrated description of a profitable smelting plant in the Caucasus, handling low-grade ore. 3800 w. Eng & Min Jour—July 5, 1913. No. 43481.

Historical Note on Copper Smelting. A review of copper smelting from its appearance among the Egyptians, about 6500 years ago, to the time of Agricola. 2500 w. Eng & Min Jour—Aug. 23, 1913. No. 44553.

New Smeltery of the United Verde Copper Company. Richard H. Vail. Illustrated description of plant under con-

Consult Classification of the Index. See page 9.

Sulphide Ores

struction at Clarkdale, Arizona. 4000 w. Eng & Min Jour—Aug. 16, 1913. Serial, 1st part. No. 44422.

The Smelting of Copper Ores in the Electric Furnace. Dorsey A. Lyon and Robert McKeeney. A comparative study of the electric smelting of copper ores and the combustion furnace. Ills. 11500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44760 F.

Copper Smelting Practice in the Southwest. Thomas T. Read. Discusses the salient features of present practice in this district. Ills. 5500 w. Min & Sci Pr—Oct. 4, 1913. No. 45749.

See also Concentration, Converters and Refining, under *Copper*.

Sulphide Ores

The Sulphide Ores of Copper. Some Results of Microscopic Study. L. C.

GOLD AND SILVER**Assaying**

Graton and Joseph Murdock. Report of a study made to learn as much as possible of the general features of these ores; and how primary and secondary copper ores can be positively identified. Ills. Discussion, 21500 w. Bul Am Inst of Min Engrs—May, 1913. No. 42457 F.

Transvaal

Mining Copper Ores at Messina. J. Allan Woodburn. An account of the only producing copper mine in the Transvaal. Ills. 5500 w. Jour Chem, Met, & Min Soc of S Africa—Aug, 1913. No. 45895 E.

Utah

Recent Development of the Utah Copper Company Mines. D. C. Jackling. Abstract from the general manager's annual report for 1912. 3000 w. Min & Sci Pr—May 31, 1913. No. 42618.

GOLD AND SILVER**Alaska**

Mining in Alaska in 1912. Abstract of report of Alfred H. Brooks to the director of the U. S. Geol. Survey. Information concerning the production, value and methods. 2000 w. Eng & Min Jour—Jan. 11, 1913. No. 38993.

Alaska Gold Mine Co. Reviews the first report of this company covering the period from its organization in August, to the end of 1912. 2000 w. Eng & Min Jour—June 7, 1913. No. 42704.

The Treadwell Group of Mines, Alaska, in 1912. Information from the annual report of these mines for 1912. The development work, ore reserves, cyanide plant, labor conditions, etc. 2800 w. Min & Sci Pr—June 21, 1913. No. 43232.

Preparatory Work of the Alaska Gold Mines Company. Grant H. Tod. Illustrated account of the mine development, mill construction, etc. 1000 w. Min & Sci Pr—Aug. 2, 1913. No. 44223.

The Fineness of Gold in the Fairbanks District, Alaska. Philip S. Smith. Map and statement of the fineness of the placer gold found on the creeks in the Fairbanks region, Alaska, with location of the known lode mines and prospects. 2500 w. Ec-Geol—Aug., 1913. No. 44381 D.

Lode Mining in the Willow Creek District. Sumner S. Smith. Illustrated account of these mines in Alaska. 2000 w. Min & Sci Pr—Aug. 30, 1913. No. 44948.

Assaying

New Volumetric Methods in Vogue at Mints. Harold French. Describes methods and gives results obtained. 3000 w. Min & Eng Wld—Nov. 9, 1912. No. 37348.

Variations in Assaying at the Alaska-Treadwell. W. P. Lass. Gives the writer's conclusions in accounting for the variations. 800 w. Mining Mag—Jan., 1913. No. 39433 B.

Errors in Sampling and Assaying Ores Due to the Presence of Coarse Gold. Franklin White. Gives results of an investigation of low grade ore to determine the cause of differences in assay returns. 4500 w. Inst of Min & Met, Bul 103—April 10, 1913. No. 41692 N.

The Gay-Lussac Method of Silver Determination. Frederic P. Dewey. Outlines its use in the determination of silver in standard silver (ingots and coin), discussing points in detail, especially the accuracy of the results. 4500 w. Bul Am Inst of Min Engrs—April, 1913. No. 41661 F.

Assay of Gold and Silver by the Iron Nail Method. E. J. Hall and C. W. Drury. Enumerates the advantages and disadvantages of the method, gives results of experiments made and conclusions. 2500 w. Bul Am Inst of Min Engrs—June, 1913. No. 43259 F.

Volumetric Determination of Gold. Victor Lenher. Excerpt from *Jour. Am. Chem. Soc.* Gives a method of estimating gold volumetrically with ease and accuracy. 1200 w. Min & Sci Pr—June 21, 1913. No. 43233.

Notes on the Assay of Mine Samples. Robert Dures. Considers the assaying of samples from the working faces in the mine, pointing out some of the errors that may occur. 2200 w. Jour Chem, Met, and Min Soc of S Africa—June, 1913. No. 44300 E.

Consult Classification of the Index. See page 9.

Assaying

How Gold Is Bought. Jesse Simmons. Illustrates and describes the methods of the United States assay office. 2000 w. Sci Am—Nov. 16, 1912. No. 37557.

Buying and Selling Silver and Gold. H. J. Slaker. Illustrates and describes the scientific side of the assay office at New York. Methods of silver and gold refining, the equipment, etc. 3000 w. Sci Am—Aug. 23, 1913. No. 44499.

Treatment of Gold and Silver at the United States Assay Office in New York City. Illustrated description of the plant on Wall St., its methods and operation. 2500 w. Brass Wld—Sept., 1913. No. 45205.

The Quantitative Determination of the Precious Metals—Gold, Silver and Platinum. Trinker. Trans. from *Metallurgie*. Describes a method which allows of the determination of platinum and gold with an accuracy of 0.05 per cent. 1500 w. Met & Chem Engng—Oct, 1913. No. 45781 C.

Australia

Mt. Grainger Goldfield (S. A.). R. Lockhard Jack. Information from an official report concerning this South Australian gold mine. 3800 w. Aust Min Stand—May 15, 1913. No. 42872 B.

See Crushers, under *Ore Dressing and Concentration*.

Black Sands

Investigation of Feather River Black Sands. Edwin A. Sperry. Reports results of an examination of these sands and tests made. Ills. 2000 w. Min & Sci Pr—Nov. 16, 1912. No. 37716.

The Black Sands of Paracale. Paul R. Fanning and F. T. Eddingfield. Reports an investigation of the black sands of Luzon. Ills. 8700 w. Philippine Jour of Sci—Aug., 1912. No. 39242 N.

The Recovery of Black Sand and Floating Particles of Metallic Minerals. J. M. Neill. Gives reasons for conserving the black sand showing the gain in recovery by extracting and treating separately this valuable constituent. 2500 w. Jour Chem, Met, & Min Soc of S Africa—March, 1913. No. 41992 E.

See same heading, under *Copper*.

British Columbia

Standard Silver Mine. William Fleet Robertson. Describes the development, the ore, and the milling method. 2200 w. Mines & Min—Dec., 1912. No. 38010 C.

Surf Inlet Gold Mines. Fred M. Wells. Information concerning these gold mines on Princess Royal Island on the coast of British Columbia. 2000 w. Can Min Jour—May 1, 1913. No. 41893.

The Standard Mine, Silverton, B. C. John Vallance. Brief description of the

GOLD AND SILVER

Cobalt

vein and ore bodies, workings, and equipment. 1000 w. Jour Can Min Inst—Vol. XIV. No. 42024 N.

See same heading, under *Copper*.

California

The Mother Lode Region, California. Lewis H. Eddy. Describes the region, the ore, present practice of mining and milling. Ills. 4500 w. Eng & Min Jour—Feb. 22, 1913. No. 39996.

The Mother Lode of California. J. H. G. Wolf. Maps, illustrations and description of the belts of the Mother Lode, with general observations. 2000 w. Min & Sci Pr—June 21, 1913. Serial. 1st part. No. 43231.

Sixty Years of Mining in California. W. H. Storms. Reviews the history of the discovery and mining of gold. 2500 w. Min & Engng Wld—Aug. 2, 1913. Serial, 1st part. No. 44134.

Canada

Development and Costs at the Kerr Lake. Robert Livermore. Information from the last annual report. 2200 w. Min & Engng Wld—Oct. 4, 1913. No. 45676.

Chile

The Gold-Copper Ore Deposits of the Guanaco, Chile. H. Thiel and H. Müller. Abstract trans. from *Die Zeit für prak. Geol.* Describes the deposits, and mining methods. 1200 w. Min Jour—July 26, 1913. No. 44169 A.

Cobalt

Cobalt. Charles A. O'Connell. A summary of progress and account of recent developments. Map. 1200 w. Mining Mag—Dec., 1912. No. 38634 B.

The Relation of Transportation to Mining in Cobalt. A. A. Cole. Information concerning freight rates on silver ores, and related subjects. 1000 w. Can Min Jour—Dec. 1, 1912. No. 38042.

Nipissing High Grade Mill, Cobalt. Herbert A. Megraw. Describes a mill treating rich silver ore by a combination of amalgamation and cyanidation. 2000 w. Eng & Min Jour—Dec. 14, 1912. No. 38192.

Cobalt and Adjacent Areas. Willet G. Miller. Reviews briefly the production, geological history, structure, etc. Ills. 1500 w. Can Min Jour—Feb. 1, 1913. No. 39660.

The Coniagas Mine, Cobalt, Ontario. Reginald E. Hore. Historical sketch of the mine which was discovered in May, 1904. The ore is native silver with arsenides of cobalt and nickel. Ills. 1300 w. Eng & Min Jour—May 17, 1913. No. 42228.

The Future of the Cobalt District, Ont. Charles A. O'Connell. Reviews briefly

Consult Classification of the Index. See page 9.

Cobalt

the past seven years production and gives a hopeful outlook. Discussion. 1600 w. Jour Can Min Inst—Vol. IV. No. 42046 N.

The Probable Total Production of Silver from the Cobalt District. G. R. Mickle. An estimate explaining method of calculation. Map. 4500 w. Jour Can Min Inst—Vol. XV. No. 42045 N.

Methods of Mining at Cobalt. Reginald E. Hore. Illustrates and describes past and present practice. 1000 w. Can Min Jour—Aug. 1, 1913. No. 44204.

Milling at Cobalt. Fraser Reid. History and description of the milling practice. Ills. 1200 w. Min & Sci Pr—Aug. 9, 1913. No. 44361.

The Cobalt Area. Willet G. Miller. Extracts from Guide Book No. 7, published by Geol. Survey of Canada. Description and information. 2000 w. Can Min Jour—Sept. 1, 1913. Serial, 1st part. No. 44867.

Amalgamation and Cyanidation of Cobalt-Silver Ores. Reginald E. Hore. Describes the treatment of high grade ore, and low grade cyanide plants. Ills. 3300 w. Can Min Jour—Sept. 15, 1913. No. 45213.

Colombia

The Gold Placers of Antioquia, Republic of Colombia, South America. M. H. de Hora. A brief study of the location of the places in relation to nearby ore fields. Map. 1200 w. Bull Am Inst Min Engrs—July, 1913. No. 44011 F.

Colorado

The Genesis of Ore Bodies in Leadville, Colorado (Zur Frage der Entstehung der Erzlagertstätten von Leadville, Kolorado). L. Rose. A geological study of the faults and crevices in these gold fields, in the light of recent developments. Ills. 1500 w. Glückauf—June 7, 1913. No. 43511 D.

Clear Creek and Gilpin County Notes. Stephen L. Goodale. Reviews these districts which are technically interesting. Some placer mining still conducted. Ills. 2000 w. Eng & Min Jour—Aug. 2, 1913. No. 44127.

The Platoro District, Colorado. Carl A. Allen. Illustrates and describes several camps in the region. Gold and silver are found with copper in quartz veins in diorite and rhyolite. 1800 w. Eng & Min Jour—Sept. 27, 1913. No. 45496.

See Placers, under *Gold and Silver*.

Concentration

Concentration of Cobalt Silver Ores. Reginald E. Hore. Gives tabulated results of concentration in Cobalt during 1912, describing the processes used. Ills. 1200 w. Can Min Jour—July 1, 1913. No. 43323.

GOLD AND SILVER**Costs**

Operating Costs at a Small Free-Milling Gold Mine. A. H. Gracey. Presents cost data, relating to the mining, milling, etc., of a small vein of free milling gold ore. 1000 w. Jour Can Min Inst—Vol. XV. No. 42054 N.

Cripple Creek

Cripple Creek in the Early Days. G. L. Sheldon. Personal reminiscences. 1200 w. Eng & Min Jour—Jan. 25, 1913. No. 39377.

Cyanidation

Calculation of Extraction in Cyanidation. Herbert A. Megraw. Discusses points as to the means and methods of sampling and calculating extractions. 3000 w. Eng & Min Jour—Sept. 6, 1913. No. 44991.

Solution Control in Cyanidation. A. W. Allen. Shows the necessity for adequate solution control and gives a résumé of a series of tests. 3500 w. Min & Sci Pr—Sept. 20, 1913. No. 45441.

Cyanide Experiments on Gold Ores from Great Depths (Cyanlaugerversuche mit Golderzen der Hohen Tauern). Roland Sterner-Rainer. Results of extensive laboratory tests. Ills. Serial, 1st part. 2800 w. Oest Zeit f Berg u Hütten—Aug. 16, 1913. No. 45372 D.

Ores Amenable to Cyanidation. Herbert A. Megraw. A discussion of the various ores upon which cyanidation has been tried. 6000 w. Eng & Min Jour—Oct. 4, 1913. No. 45669.

Cyanide

Cyanide Practice in the Black Hills, South Dakota. H. C. Parmelee. Explains the general conditions, and gives information concerning the methods by the Golden Reward Co. in the present article. 4500 w. Met & Chem Engng—July, 1913. Serial, 1st part. No. 43487 C.

The Gold Road Cyanide Mill, Arizona. Herbert A. Megraw. Illustrated description of the plant. Treatment is by the all-slime method, using Pachuca tanks for agitation. 2500 w. Eng & Min Jour—July 5, 1913. No. 43480.

Cyanide Mills

The Argo Cyanide Mill, Idaho Springs, Colo. Stephen L. Goodale. Illustrated description of a custom mill at the mouth of the Newhouse tunnel. 2500 w. Eng & Min Jour—Aug. 30, 1913. No. 44886.

Requirements of Small Cyanide Mills. Algernon Del Mar. A discussion of ways and means of constructing such plants economically. Ills. 1500 w. Eng & Min Jour—Oct. 25, 1913. No. 46205.

Cyanide Plants

Two Arizona Cyanide Mills. Herbert A. Megraw. Discussion of the Tom Reed

Consult Classification of the Index. See page 9.

Cyanide Solutions

mill, at Oatman, and the Vulture mill, at Wickenburg, Ariz., which are situated so that living and working conditions are difficult. Ills. 2500 w. *Eng & Min Jour*—Aug. 2, 1913. No. 44128.

Cyanide Solutions

The Electrolysis of Cyanide Solutions. Edward F. Kern. Abstract of paper read before the Am. Elec.-Chem. Soc. An account of experimental work to determine the validity of conflicting statements. 1500 w. *Min & Sci Pr*—Oct. 11, 1913. No. 45909.

Cyaniding

The Action of Oxidizers in Cyaniding. Morris Green. Describes investigations carried out which show that a solution of chemically pure potassium cyanide in freshly prepared distilled water dissolves gold more rapidly than an older solution. 3500 w. *Jour Chem, Met & Min Soc of S Africa*—Feb., 1913. No. 41216 E.

Cyaniding Zambona Low-Grade Silver Ore. Harley A. and Rush T. Sill. Describes treatment of low-grade ores at a profit even when worked in quantities of only 150 tons per day. 2000 w. *Eng & Min Jour*—April 12, 1913. No. 41189.

The Cyanide Process in Canada. Herbert A. Megraw. An account of practice at Cobalt mines. 2000 w. *Can Min Jour*—April 1, 1913. No. 41095.

The Cyanide Process in Canada. Herbert A. Megraw. Explains the situation as regards cyanidation. 1800 w. *Qr Bul of Can Min Inst*—March, 1913. No. 41598 N.

Cyaniding at the Nevada Wonder Mill. Herbert A. Megraw. Detailed description of a cyanide plant situated at a distance from railroad communication, resulting in high transportation costs. 1500 w. *Eng & Min Jour*—April 5, 1913. No. 41111.

Cyaniding Silver at the Nevada Hills Mill. Herbert A. Megraw. Illustrated description of a plant in the Nevada desert. Classified concentration is practiced, and all pulp reduced to slime for agitation. 2000 w. *Eng & Min Jour*—March 29, 1913. No. 40952.

Cyaniding the Ores of Republic, Wash. Herbert A. Megraw. An account of the successful treatment of exceptionally refractory ores. Ills. 3500 w. *Eng & Min Jour*—April 26, 1913. No. 41543.

Cyaniding at Grass Valley, California. Herbert A. Megraw. Describes cyanidation after amalgamation of a free milling gold ore. Ills. 1500 w. *Eng & Min Jour*—May 17, 1913. No. 42229.

The Black Oak Cyanide Plant, California. Herbert A. Megraw. Illustrates and describes what is said to be the only all-slime mill in California. 1500 w.

GOLD AND SILVER**Dredging**

Eng & Min Jour—June 14, 1913. No. 42831.

Cyanide Practice in India. Hugh M. Leslie. Outlines the work accomplished by the author during over 17 years residence in the East, describing the treatment by cyanide, from the time the process was introduced in 1894 till the present day. Ills. 7000 w. *Jour Chem, Met & Min Soc of S Africa*—March, 1913. No. 41991 E.

Continuous Agitation with Barren Cyanide Solution. C. F. Spaulding. Suggestions for treating slimes. Ills. 1200 w. *Min & Sci Pr*—June 21, 1913. No. 43235.

Notes on the San Francisco Mill, Pachuca, Mexico. J. P. Holcombe. Describes the present condition of the plant which is electrically equipped throughout. 1700 w. *Inst of Min & Met, Bul* 103—April, 1910. No. 41691 N.

Laboratory Test on Cyanide Ore. Describes a system of laboratory treatment to determine the suitability of an ore to treatment by the cyanide process. 1800 w. *Queens Gov Min Jour*—May 15, 1913. No. 43167 B.

Deep Mining

Results of Deep Mining in California. Al. H. Martin. Illustration, with account of the deepest gold mines in America, showing the persistent nature of the gold deposits of the Mother Lode. 2000 w. *Mines & Min*—Nov., 1912. No. 37190 C.

The Problem of Gold at Depth and Its Relation to Rand Banket. Hugh F. Marriott. Deals with the geology of the Rand. 2000 w. *S African Mine Jour*—Sept., 1912. (Special.) No. 37845 N.

The Problems of Gold at Depth. Hugh F. Marriott. From *S. African Min. Jour*. Discusses particularly the deposits of the Rand. 1600 w. *Can Min Jour*—Aug. 1, 1913. No. 44207.

Deposits

The Transportation and Deposition of Gold in Nature. Victor Lenher. Explains chemical means of holding gold in solution and phenomena in connection with its transportation and deposition. 2500 w. *Ec Geol*—Dec., 1912. No. 39341 D.

Hydrothermal Alternation of Granite and the Source of Vein-Quartz at the St. Anthony Mine. Elwood S. Moore. An illustrated study of this mine in Ontario, giving analyses and figures that strengthen the theories of ore deposition. 2500 w. *Ec Geol*—Dec., 1912. No. 39342 D.

Dredging

Dredging on Butte Creek, California. Lewis H. Eddy. Describes two bucket-elevator gold dredges, showing differences

Dredging

in constructional details. Ills. 5000 w. Eng & Min Jour—Nov. 16, 1912. No. 37597.

Righting the Calaveras Dredge. Lewis H. Eddy. Gives the history of a 6-cu. ft. gold dredge, showing the endurance through constant operation and two serious mishaps. Ills. 2500 w. Eng & Min Jour—Nov. 30, 1912. No. 37959.

Review of Gold Dredging in 1912. Charles Janin. Information concerning the work in the United States outside California, Alaska and the Yukon Territory. Ills. 2500 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38928 C.

Gold Dredging in 1912. Robert E. Cranston. Reports little advance during the past year, reviewing operations in different fields. Map. 1800 w. Eng & Min Jour—Jan. 11, 1913. No. 38992.

Gold Dredging in California. Charles Janin. A review of operations during the year. 2500 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38933 C.

Some New Gold Dredges in Alaska. Lewis H. Eddy. Gives, briefly, details of five new dredges. Ills. 1000 w. Eng & Min Jour—Jan. 25, 1913. No. 39375.

The Evolution of Gold Dredging Machinery. A. H. Martin. Reviews, briefly, the development of the gold dredge and its equipment. 1200 w. Mach, N Y—Jan., 1913. No. 38727 C.

Proposed Regulating of Gold-Dredging. Charles Janin. Reviews the history of gold-dredging, the area of land affected, reclaiming dredged land, and related subjects. 3500 w. Min & Sci Pr—March 8, 1913. No. 40626.

Mining Gold by Proxy. Arthur L. Dahl. Illustrated description of a gold dredge and its operation. 1000 w. Sci Am Sup—May 24, 1913. No. 42315.

Righting an Overturned Gold Dredge. Lewis H. Eddy. Illustrated account of the righting of Natomas No. 5, which sank in 49 ft. of water, starboard side down, June 8, 1913. 2000 w. Eng & Min Jour—Oct. 25, 1913. No. 46206.

Electric Power

Electrification of a Rand Gold Property. An account of the general electrification of the Rand mining properties. The present article describes particularly the plant of the Randfontein Central. 3500 w. Aust Min Stand—March 6, 1913. Serial. 1st part. No. 40996 B.

Electrolytic Refining

The Electrolytic Refinery at Trail, B. C. John F. Miller. From a paper read before the Can. Min. Inst. Illustrated detailed description of the plant. 2000 w. Min & Engng Wld—July 12, 1913. No. 43686.

GOLD AND SILVER**Enrichment**

Secondary Sulphide Enrichment of Ores. C. F. Tolman, Jr. Explains the general nature of the process, the zones developed by reworking deposits, and the chemistry as related to copper ores. 5000 w. Min & Sci Pr—Jan. 4, 1913. Serial. 1st part. (Special.) No. 38927 C.

The Secondary Enrichment of Silver Ores. H. C. Cooke. Describes work undertaken to test some of the hypotheses and to discover if possible in the laboratory the actual extent and speed of the reactions. 7500 w. Jour of Geol—Jan.-Feb., 1913. No. 40220 E.

Metasomatism in Downward Sulphide Enrichment. Edson S. Bastin. Mainly a description of the exact mode of occurrence of secondary silver minerals in Colorado. Ills. 3300 w. Ec-Geol—Jan., 1913. No. 39953 D.

Geology

The Secondary Precipitation of Gold in Ore Bodies. Albert D. Brokaw. Experimental study of the precipitation of gold, particularly the conditions under which gold and manganese dioxide may be precipitated simultaneously. 5000 w. Jour of Geology—April-May, 1913. No. 42329 E.

Georgia

Outlook for the Gold Mining Industry of Georgia. S. W. McCallie. Gives the history and description of the gold deposits, the method of mining and milling, etc. Ills. 1600 w. Min & Engng Wld—Jan. 4, 1913. No. 38831.

Gold Estimation

The Determination of Gold in the Presence of Iridium and Allied Metals in Materials Such as Black Sand. Two prize papers by James Gray, and by Chris. Toombs. Deals with methods, reporting research work. 5500 w. Jour Chem, Met & Min Soc of S. Africa—July, 1913. No. 45137 E.

Goldfield, Nev.

Relation of Faulting and Mineralization in Goldfield. Corbin Barnes and E. A. Byler. Points out the relation between the Columbia Mt. fault and the mineralization of the Goldfield Consolidated, and the Florence mines. 1500 w. Min & Sci Pr—July 12, 1913. No. 43747.

Gold Fields

The World's Gold Supply and the Development of the East. Considers suggestions under advisement in India and China. 3500 w. Min Jour—Feb. 22, 1913. No. 40306 A.

Wyreema Gold Mine, Jordan Creek, Goldfield. Lionel C. Ball. Map and illustrated description of this district, review-

Gold Ores

ing its history. 2500 w. Queens Gov Min Jour—May 15, 1913. No. 43166 B.

Gold Ores

Notes on Mining and Treatment of Gold Ores. R. B. Lamb. Discusses mining methods and metallurgical processes for the extraction and treatment of gold ores during recent years, indicating probable future progress. 5300 w. Can Min Jour—April 1, 1913. No. 41096.

Grading

Grading Analyses and Their Application to Cyanidation, Classification, etc. John W. Bell. Outlines a series of grades proposed by H. Stadler, pointing out applications in connection with Cyanidation and classification. 1600 w. Qr Bul of Can Min Inst—March, 1913. No. 41597 N.

Grinding Pans

Grinding Pans at Kalgoorlie. M. W. von Bernewitz. Deals with pan practice at Kalgoorlie, describing these useful and economical grinding machines. Ills. 1800 w. Min & Sci Pr—May 17, 1913. No. 42302.

Honduras

The Olancho Country. A. D. Akin. An account of the placers, cost of operation, working conditions, natural advantages, etc. 3000 w. Min & Sci Pr—July 12, 1913. No. 43744.

Idaho

Big Creek Gold District, Idaho. Robert N. Bell. Information concerning a promising gold-producing district. 600 w. Eng & Min Jour—Nov. 9, 1912. No. 37364.

The Elk City Mining District, Idaho County, Idaho. Arthur L. Flagg. Map and description of this gold district. 4500 w. Bul Am Inst of Min Engrs—April, 1913. No. 41659 F.

Electrical Applications in the Cœur d'Alenes. J. B. Fisk. Remarks on the general application of electricity to mining, reviewing the history of early applications, and especially developments in the district named. Ills. 3500 w. Min & Engng Wld—July 26, 1913. No. 43940. The Cœur d'Alene Mining District. F. R. Ingalsbe. Outlines the nature of these deposits in Idaho. 3500 w. Eng & Min Jour—July 26, 1913. No. 43930.

Kalgoorlie

Geology of the Kalgoorlie Goldfield. Malcolm MacLaren and J. Allan Thomson. Information based on results of a geological survey of the Kalgoorlie goldfield in Western Australia extending from April, 1909, to March, 1910. 3000 w. Min & Sci Pr—July 12, 1913. Serial, 1st part. No. 43743.

GOLD AND SILVER

Montana

Klondike

Quartz Mining in the Klondyke District. Abstract of a report by D. D. Cairnes. Describes the deposits, and gives information concerning the more promising properties. 4000 w. Can Min Jour—Dec. 1, 1912. No. 38044.

The Gold of the Klondike. J. B. Tyrrell. Abstract of a paper before the Roy. Soc. of Canada. Describes this region, its geology, placers, transportation of loosened rock, concentration and deposition, character of the gold, etc. Ills. 8000 w. Can Min Jour—May 1, 1913. No. 41892.

Launder

Large Reinforced-Concrete Launder. Claude T. Rice. Illustrated description of a launder used at the Baltic mill to carry away the overflow after dewatering the tailings. 1500 w. Eng & Min Jour—July 5, 1913. No. 43482.

Low Grade

Low Costs at Wasp No. 2 Mine. Leroy A. Palmer. Describes successful methods employed in stripping, mining and milling gold ore of very low grade. Ills. 2500 w. Mines & Min—Dec., 1912. No. 38011 C.

Mexico

Historical and Mining Notes of Sonora, Mexico. Claud Hafer. Abstract translations from various sources, describing the resources and their development. 2500 w. Min & Engng Wld—Nov. 16, 1912. No. 37610.

The Badirahuato District, Sinaloa, Mexico. G. L. Sheldon. An account of the silver and copper mines of the district. 2500 w. Eng & Min Jour—Nov. 23, 1912. No. 37766.

Milling

Slow-Speed Milling. E. E. Carter. Explains the principles of the arrastre, where amalgamation is preferable, and other milling details. 2000 w. Min & Sci Pr—June 7, 1913. No. 42803.

Mills

The MacNamara Mill, Tonopah. Illustrated description of a modern little plant that has been in operation for a year. 1200 w. Min & Sci Pr—Jan. 25, 1913. No. 39578.

Montana

The Southern Cross Mine, Georgetown, Mont. Paul Billingsley. Describes the geology, the character of the ore bodies, and development, reviewing the history and discussing the origin of these gold-bearing pyritic deposits. Ills. 2500 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45465 F.

Nevada

GOLD AND SILVER

Ore Deposits

Nevada

Geology of the National Mining District, Nevada. Alexander N. Winchell. Map and illustrated description of the geology, petrography, and ore deposits. Copper, lead, silver and gold are recovered. 5000 w. *Min & Sci Pr*—Nov. 23, 1912. No. 37917.

The Abnormal Temperatures on the Comstock Lode. Augustus Locke. Gives data and hypotheses as to the source of the heat. 1000 w. *Ec-Geol*—Sept., 1912. No. 37674 D.

Vein System of the Comstock. Dwight T. Smith. Outline map and description. 1000 w. *Eng & Min Jour*—Nov. 9, 1912. No. 37366.

A Study of Ores from Austin, Nev. H. B. Taylor. A descriptive study of the deposits and their origin. Ills. 2500 w. *Sch of Mines Qr*—Nov., 1912. No. 38558 D.

Operation of the Tonopah Belmont Mine, Nevada. Frederick Bradshaw. Information from the annual report of the company, as to operating costs, ore reserves, retimbering of the shafts, etc. 1600 w. *Min & Sci Pr*—May 17, 1913. No. 42301

Ore Deposits of the Prince Consolidated Mines. D. W. Jessup. Describes the geology of this Nevada district, the ore-bodies and their genesis, nature of the ore, etc. The ores are low-grade, known as iron-manganese ores, and their value lies in their service for fluxing at the smelters. Ills. 1800 w. *Min & Sci Pr*—May 24, 1913. No. 42510.

Operation of the West End Mill, Tonopah. Jay A. Carpenter. Information abstracted from the last annual report. 1600 w. *Min & Sci Pr*—Aug. 2, 1913. No. 44224.

New Zealand

The Reefton Goldfield, New Zealand. Ernest K. Hall. Describes the main features of the district, the exceptional ore bodies, and some of the problems. 3500 w. *Aust Min Stand*—Dec. 19, 1912. No. 39763 B.

The South Island of New Zealand. G. W. Easton Turner. Deals with gold recovery from the black sand beaches lying immediately inland above the tide level. 2200 w. *Aust Min Stand*—July 3, 1913. No. 44301 B.

Nicaragua

The Chontales Mining District; Nicaragua. Arthur Feust. Map and illustrated description of these gold and silver mines, their early history, geological features, method of development, etc. 2500 w. *Min & Sci Pr*—Dec. 7, 1912. No. 38164.

North Carolina

A North Carolina Mining Enterprise. Claud Hafer. An account of the Iola Mine in Montgomery County. Describes the character of the gold ore, the handling of the ore, milling, etc. 1500 w. *Min & Sci Pr*—May 17, 1913. No. 42300.

Nova Scotia

An Appeal for Co-operation. Walter Henry Prest. Read before the Min. Soc. of Nova Scotia. Urges co-operation in the gold-mining industry. 3000 w. *Can Min Jour*—Nov. 1, 1912. No. 37277.

Some Characteristics of the Gold Bearing Veins of Nova Scotia. E. Percy Brown. Describes the three classes of veins, pay shoots, enrichments, etc. Ills. 2000 w. *Can Min Jour*—June 1, 1913. No. 42690.

Ontario

The Swastika Gold Area. E. L. Bruce. From the report of the Ontario Bureau of Mines. Describes the topography, geology, deposits and active properties. 3500 w. *Can Min Jour*—Jan. 1, 1913. No. 38918.

On the Origin of the Porcupine Gold Deposits. Reginald E. Hore. Attention is called to characters common to all forms of deposits, indicating their common origin, and giving some clue to their formation. Ills. 3500 w. *Jour Can Min Inst*—Vol XV. No. 42044 N.

The Hollinger Gold Mines, Ltd., Ontario. P. A. Robbins. Abstract from the annual report. 1200 w. *Min & Engng Wld*—May 3, 1913. No. 41880.

Sudbury, Cobalt and Porcupine Geology. Willet G. Miller and Cyril W. Knight. Map and illustrated description of this mining region in Ontario. 3000 w. *Eng & Min Jour*—June 7, 1913. No. 42703.

Kirkland Lake Gold Deposits. Reginald E. Hore. Describes the deposits, and gives a report of the development. Ills. 3300 w. *Can Min Jour*—July 15, 1913. No. 43821.

Sudbury, Cobalt and Porcupine. Report of the mineral production of Canada in 1912, especially the districts named. 4000 w. *Can Min Jour*—July 15, 1913. No. 43822.

Gold Deposits of Porcupine District, Ontario. Reginald E. Hore. Describes the deposits and their characteristics, modes, occurrence, etc. 2500 w. *Ec-Geol*—Aug., 1913. No. 44384 D.

See also Cobalt, under *Gold and Silver*.

Ore Deposits

The Tourmaline Silver-Lead Type of Ore Deposits. Adolph Knopf. Describes

Peru

a newly recognized type of ore deposit. A review of the occurrence of tourmaline-bearing ore bodies. 4500 w. Ec-Geol—March, 1913. No. 41278 D.

Ore Occurrence at Prince Consolidated. Edward R. Zalinski. Describes the ore-bodies in this mine at Pioche, Nevada. Ills. 2500 w. Eng & Min Jour—April 19, 1913. No. 41345.

Peru

The Gold of the Shinarump at Paria. Andrew C. Lawson. Records facts of interest with regard to the Peruvian and Shinarump formations as gold bearing deposits, and gives observations upon the stratigraphy of the section at Paria, Utah. Ills. 4500 w. Ec-Geol—Aug., 1913. No. 44380 D.

Philippines

The Major Mines. A. W. Geiger. Illustrated account of the workings of these gold mines in the island of Luzon, Philippine Is. 1200 w. Min & Sci Pr—Nov. 16, 1912. No. 37717.

Alteration and Enrichment in Calcite-Quartz-Manganese Gold Deposits in the Philippine Islands. F. T. Eddingfield. An experimental study of this class of deposits, with conclusions. 3300 w. Philippine Jour of Sci—April, 1913. No. 44057 N.

Placers

Gulch Mining in Gilpin Country. Arthur J. Hoskins. History and description of some old Colorado placers that are now being reworked by hand. Ills. 2000 w. Mines & Min—Nov., 1912. No. 37193 C.

Placer Mining in Upper Valley of Grand River, Colo. C. Hartley. Explains conditions and the causes of failure. 1500 w. Min & Engng Wld—Nov. 9, 1912. No. 37347.

Placer Gold on Meule Creek, Seignior of Rigaud-Vaudreuil, Quebec. Abstract of a report by Joseph Keele describing the geology, the mining methods, and discussing the origin of the gold. 3000 w. Can Min Jour—Nov. 15, 1912. No. 37698.

Gold Placers in Central China. E. C. Thurston. Describes examples of placer mining, showing the Chinese to be industrious workers for small returns. Ills. 2500 w. Min & Sci Pr—Feb. 15, 1913. No. 39964.

A Trip to the Siberian Placers. Alexander P. Rogers. Illustrated account of a trip made to examine placer properties. 3000 w. Eng & Min Jour—Feb. 8, 1913. No. 39735.

Preliminary Testing of Placer Ground. A combination Empire and Keystone drilling outfit is described by William F.

GOLD AND SILVER

Purification

Ward. Ills. 2500 w. Eng & Min Jour—April 5, 1913. No. 41113.

Examining a Peruvian Placer. Pierre Bouery. Gives briefly the history of their discovery, origin of the placers, climatic conditions, labor, etc. Ills. 2000 w. Min & Sci Pr—June 21, 1913. No. 43234.

Nechi River Placer Mining, Colombia. William F. Ward. Information concerning the successful dredging and hydraulic mining. Ills. 2500 w. Eng & Min Jour—Aug. 16, 1913. No. 44424.

Precipitation

Metallic Minerals as Precipitants of Silver and Gold. Chase Palmer and Edson S. Bastin. Gives a summary of literature bearing on this subject and report of experiments showing that certain sulphides and arsenides of copper and nickel, precipitate metallic silver from dilute aqueous solutions of silver sulphate. Ills. 9500 w. Ec-Geol—March, 1913. No. 41280 D.

Notes on Analysis of Zinc Dust. J. E. Clennell. Describes a method for determining the constituents of the zinc dust used for precipitating gold and silver from cyanide solutions. 5500 w. Eng & Min Jour—April 19, 1913. No. 41344.

Zinc-Dust Precipitation Equipment. Donald F. Irvin. Illustrated description of a new zinc-dust feeder. 900 w. Min & Sci Pr—June 7, 1913. No. 42802.

Zinc Dust Precipitation at Cerro Prieto. Brief description of one of the earliest installations, giving operating data and costs. Ills. 1000 w. Eng & Min Jour—May 31, 1913. No. 42640.

Aluminum Precipitation at Deloro, Ontario. I. F. Kirkpatrick. Illustrated description of the first commercial application of aluminum dust for precipitating silver from cyanide solutions. 1200 w. Eng & Min Jour—June 28, 1913. No. 43307.

Gago, Entada Scandens Bentham, and Its Effect on Gold and Gold Solution. F. T. Eddingfield. A report of tests made with this juice from the plant, Entada Scandens, in local usage. 1500 w. Philippine Jour of Sci—April, 1913. No. 44058 N.

Zinc-Dust Precipitation of Gold and Silver. A. M. Merton. Explains the advantages of the use of zinc-dust and the arrangement of zinc-dust precipitating plants. 2000 w. Min & Engng Wld—Sept. 6, 1913. No. 44938.

Purification

The Purification of Gold by Means of Nitre. Describes the treatment with nitre, used only for fine gold. 2000 w. Brass Wld—March, 1913. No. 40694.

Consult Classification of the Index. See page 9.

Queensland

GOLD AND SILVER

Silver-Lead

Queensland

The Oaks Rush Goldfield. William H. Rands. Report with a view to advising on the subsidizing of certain mines in order to prove the field to a greater depth. Ills. 3500 w. Queens Gov Min Jour—Nov. 15, 1912. No. 38233 B.

Silver Spur Mine, Southern Queensland. E. Cecil Saint-Smith. Notes on its geology with suggestions as to future prospecting operations. Ills. 2500 w. Queens Gov Min Jour—Sept. 15, 1913. No. 45834 B.

Rand

Geology of the Witwatersrand. Notes from a paper giving results of Dr. Mellor's investigations. Ills. 3500 w. S African Min Jour—Sept., 1912. (Special.) No. 37873 N.

The Metallurgy of the Rand Banket. Illustrated description of the various processes carried out to recover the gold contents of the ore. 14000 w. S African Min Jour—Sept., 1912. (Special.) No. 37854 N.

Evolution in Metallurgy. H. A. White. Reviews and discusses the progress of metallurgy of gold on the Rand. 2500 w. S African Min Jour—Sept., 1912. (Special.) No. 37844 N.

Working Costs on the Rand. J. G. Lawn. Gives the history of working costs, discussing details. 3000 w. S African Min Jour—Sept., 1912. (Special.) No. 37847 N.

Rand Conditions and Future Outlook. Owen Letcher. A review, giving results of the past five years and the future outlook. 2000 w. Min & Sci Pr—June 28, 1913. No. 43398.

The Rand Banket and Its Gold Content. C. B. Horwood. Describes the mode of occurrence and origin of the pyritic replacements found in the gold-bearing "bankets" of the Witwatersrand. Also editorial. Ills. 6000 w. Min & Sci Pr—Oct. 11, 1913. Serial, 1st part. No. 45906.

See also Deep Mining, under *Gold and Silver*; Engineers, under *INDUSTRIAL ECONOMY*, and Hygiene, and Ventilation, under *MINING AND METALLURGY*, *Mining*.

Refining

Evolution of an Electrolytic Refinery. Harold French. Discusses improved processes introduced in the Federal plants. 5500 w. Min & Sci Pr—Dec. 14, 1912. Serial. 1st part. No. 38307.

Electrolysis of Low Grade Gold Bullion. Theodore W. Bouchelle. Reports experiments in the chemical and electrolytic refining of a low-grade bullion. 2500 w. Eng & Min Jour—Jan. 25, 1913. No. 39379.

Refining at Pittsburgh—Silver Peak Mill. Lyon Smith. Outlines details of operations. Ills. 1000 w. Eng & Min Jour—March 22, 1913. No. 40755.

Reviews of 1912

I. Gold and Silver Production of the World in 1912. A general review. II. Gold and Silver Production in the United States. Review of the year's production and prices. 3500 w. Min & Engng Wld—Jan. 25, 1913. No. 39415.

Gold and Silver Production in 1912. Frederick Hobart. The gold production exceeded that of any previous year. The silver market was strong. 1500 w. Eng & Min Jour—Jan. 11, 1913. No. 38980.

Progress in Gold-Silver Ore Treatment During 1912. Alfred James. A review of general tendencies and changes, giving details of practice. Ills. 5000 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38923 C.

Cobalt in 1912. Joseph T. Mandy. Review of the progress at this silver mining camp. 3000 w. Min Jour—Jan. 18, 1913. No. 39468 A.

See also Alaska, and Dredging, under *Gold and Silver*, and Cyaniding, and Stamp Mills, under *Ore Dressing and Concentration*.

Rhodesia

Rhodesia. Illustrated review of the mining and metallurgy of the territories of the British S. Africa Co. 1500 w. S African Min Jour—Sept., 1912. (Special.) No. 37863 N.

The Rhodesian Small-worker. R. W. Pringle. Illustrates and describes some of the typical small mines. 3000 w. S African Min Jour—Sept., 1912. (Special.) No. 37865 N.

Sampling

The Sampling of Gold-Bullion. Discussion of the paper of Frederic P. Dewey. 1000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40905 F.

School Laboratory Work: Sampling of an Ore Containing Coarse Gold. Charles E. Locke. An account of a recent run in the stamp-mill of the Mass. Inst. of Technology. 1200 w. Bul Am Inst of Min Engrs—March, 1913. No. 40900 F.

Silver

Mineral Hill Silver Field, N. S. W. E. F. Pittman. Describes the deposit which is apparently of considerable volume and richness. 2200 w. Aust Min Stand—Nov. 7, 1912. No. 38107 B.

Silver-Lead

Mining the Prince Consolidated Ores. D. W. Jessup. Describes the shrinkage system employed in mining the large ore body, and the room and pillar system used

Slimes

for the 18-ft. ore bed. 2800 w. *Min & Sci Pr*—May 31, 1913. No. 42621.

Slimes

The Evolution of the Round Table for the Treatment of Metalliferous Slimes. Theodore Simons. An historical review of old sliming methods leading up to the present round-table treatment. Ills. 6000 w. *Bull Am Inst Min Engrs*—July, 1913. No. 44010 F.

South Africa

Some Features of Mining in South Africa. J. Allan Woodburn. Notes on points of general importance in the various forms of mining. 2500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37855 N.

What South Africa Owes to the Mining Industry. David Harris. A history and review of how the country has been built up on the gold and diamond mines. 1000 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37840 N.

The Pilgrims Rest and Sabie Gold Fields. Arthur W. Hendren Frost. Illustrated account of the oldest gold mining center in South Africa. 5000 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37866 N.

Mining in Swaziland. Allister M. Miller. History and review of the tin and gold prospects. 2000 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37849 N. Government Gold Mines in South Africa. A Cooper Key. Explains the scheme adopted of letting the Crown lands for mining. 1200 w. *Eng & Min Jour*—Jan. 4, 1913. No. 38809.

South Dakota

Mining at the Wasp No. 2, in the Black Hills, South Dakota. Jesse Simmons. Illustrated description of methods of mining and milling low-grade ore. 1500 w. *Eng & Min Jour*—Jan. 4, 1913. No. 38806.

Sulphide Ores

On the Behavior of Cold Acid Sulphate Solutions of Copper, Silver, and Gold with Alkaline Extracts of Metallic Sulphides.

IRON AND STEEL

Alabama

Frank F. Grout. Gives experiments designed to indicate the natural process by which secondary sulphides of the metals may be precipitated. 8000 w. *Ec-Geol*—Aug., 1913. No. 44379 D.

Tonopah

Metallurgy at Tonopah. M. W. von Bernewitz. Describes interesting treatment methods at this mining center of Nevada. Ills. 2500 w. *Min & Sci Pr*—Dec. 28, 1912. No. 38766.

Transvaal

Past, Present and Future of Mineral Exploration in the Transvaal. Oliver King. Illustrated review. 4000 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37868 N.

The Messina (Transvaal). Development Co., Ltd. J. M. Calderwood. Reviews the history, describing the development and mining methods. 2500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37857 N.

Veins

Artificial Vein-Formation in the Tomboy Mill, Telluride, Colo. J. F. Kemp. A study of formations around the drain pipes that had been buried beneath a layer of concentrate. Ills. 1500 w. *Ec Geol*—Sept., 1913. No. 45825 D.

Witwatersrand

Origin of the Auriferous Conglomerates on the Witwatersrand. Richard Beck. Discusses the four principal theories advanced. 1600 w. *Min & Sci Pr*—May 10, 1913. No. 42081.

The Witwatersrand Gold Industry in 1912. W. L. Honnold. Report of average working cost, profit, financial policy, etc. 1800 w. *Min & Sci Pr*—Aug. 2, 1913. No. 44222.

Yukon

The Development and Problem of the Yukon. Henry M. Payne. Outlines the general characteristics of the region, the processes by which the gold is removed, and some of the problems to be solved. 4000 w. *Qr Bul of Can Min Inst*—March, 1913. No. 41599 N.

IRON AND STEEL

Agglomeration

Modern Process in the Agglomeration of Iron Ores (Les procédés modernes d'agglomération des minerais de fer). Henry Martin. This issue describes methods with the addition of foreign material, and briquetting. Ills. Serial. 1st part. 4500 w. *Genie Civil*—Feb. 15, 1913. No. 40593 D.

Enriching, Briquetting and Agglomerating Iron Ores and Flue Dust (Anrei-

chern, Brikettieren und Agglomerieren von Eisenerzen und Gichtstaub). A Weiskopf. A summary of binding methods and materials used in large European and American steel works. Serial. 1st part. 4200 w. *Stahl u Eisen*—Feb. 13, 1913. No. 40502 D.

Alabama

Progress in Steel Making in Alabama. Frank H. Crockard. A chapter from "Iron Making in Alabama." Considers

Consult Classification of the Index. See page 9.

Allotropy

features of the duplex process as followed at the Ensley works. 3500 w. *Ir Age*—Dec. 19, 1912. No. 38277 C.

Allotropy

On Allotropy in General and That of Iron in Particular. Prof. Carl Benedicks. Explains what is meant by allotropy and what types are considered possible, reporting experimental determinations. 8000 w. *Ir & St Inst*—Sept., 1912. No. 45200 N.

The Allotropic Transformations of Iron. Albert Sauveur. Read before the Iron & Steel Inst. Critical review of views of Carl Benedicks, given in a paper "On Allotropy in General and That of Iron in Particular." 2000 w. *Ir & Coal Trds Rev*—Sept. 5, 1913. No. 45192 A.

Alloys

Influence of Sulphur on the Stability of Iron Carbide in the Presence of Silicon. W. H. Hatfield. Gives results of some experiments made to determine the manner in which sulphur affects the stability of iron carbide. Ills. 5500 w. *Ir & St Inst*—May, 1913. No. 42241 N.

Alloy Steels

Determination of Manganese in Mild Steels and Pig Iron by Means of the Smith Ferric-Sulphate Tests (Die Manganbestimmung im Flusseisens und Roheisens nach dem Persulfatverfahren von Smith). H. Kunze. Describes process and outlines modifications suggested by the other experiments. Discussion. 3000 w. *Stahl u Eisen*—Nov. 14, 1912. No. 38406 D.

Manganese Steel for Machinery Parts. S. R. Stone. Gives examples showing a variety of service in which such castings have been used to advantage, and applications in iron and steel works equipment. Ills. 2500 w. *Ir Age*—Jan. 9, 1913. No. 38916 C.

Heat Treatment of Chrome Vanadium Steel. A. F. Mitchell. Deals particularly with the heat treatment of alloyed steels, discussing methods and tests. General discussion. Ills. 8500 w. *Pro Ry Club of Pittsburgh*—Dec. 19, 1912. No. 39938 C.

Titanium as Used in Steel Making. E. F. Lake. Information concerning metallic titanium and the benefits from its use in steel-making processes. 4000 w. *Met & Chem Engng*—March, 1913. No. 40332 C.

Metallography and High Speed Steel. Oliver W. Storey. Reviews briefly the development of high speed steels, their composition, treatment, etc. 1200 w. *Wis Engr*—March, 1913. No. 41573 C.

The Practical Use of the Iron-Carbon Equilibrium Diagram, with Special Ref-

IRON AND STEEL

erence to the Critical Points A 1, 2, 3; and the Burning of Steel. J. E. Stead. Explanations of changes and of the equilibrium diagram, and its use, with notes on the heat treatment of steel. Ills. 14000 w. *Trans N-E Coast Inst of Engrs & Shipbldrs*—March, 1913. No. 41699 N.

See also Corrosion, under ELECTRICAL ENGINEERING, *Electro-Chemistry*.

Analysis

Effect of Carbon on Quality of Charcoal Iron. J. E. Johnson, Jr. From a paper read at Cleveland meeting of the Am. Inst. of Min. Engrs. Gives results of an investigation of L. Superior charcoal irons; differences between analyses and physical properties and causes of spotted iron. Ills. 4500 w. *Ir Trd Rev*—Nov. 21, 1912. No. 37719.

Method for the Rapid Determination of Total Carbon in Iron, Steel, Cast Iron and in the Iron Alloys. H. de Nolly. Describes a method which has all the advantages of the dry method and, from the point of view of rapidity, is superior to the Eggertz calorimetric process. Ills. 1800 w. *Am Found Assn*—Dec., 1912. No. 39518 N.

New Method of Determining Sulphur in Pig Iron and Steel (Eine neue Schwefelbestimmung in Roheisen und Stahl). A. Vita and C. Massenez. Method and apparatus for fairly accurate, rapid analyses. Ills. 1000 w. *Stahl u Eisen*—Dec. 12, 1912. No. 39000 D.

The Technical Analysis of Ferrovandium and Its Products. William W. Clark. First of a series of articles on the determination of the different constituents. The present number deals with aluminum. *Met & Chem Engng*—Feb., 1913. Serial, 1st part. No. 39686 C.

Determination of Oxygen in Iron & Steel. R. H. McMillen. Explains the determination of aluminum. 1200 w. application of the electric resistance furnace to a modification of the Ledebur method. Ills. 1500 w. *Ir Age*—Jan. 30, 1913. No. 39587 C.

A New Method for the Accurate Determination of Phosphorus. C. H. Ridsdale and N. D. Ridsdale. Briefly reviews the leading ordinary methods and describes the new "mechanicalized" method. 2500 w. *Ir & St. Inst*—May, 1913. No. 42246 N.

The Volhard-Wolff Volumetric Manganese Determination (Ueber die massanalytische Manganbestimmung nach Volhard-Wolff). A report issued by the Chemical Commission of the German Iron Foundrymen's Association. 7000 w. *Stahl u Eisen*—April 17, 1913. No. 42109 D.

Consult Classification of the Index. See page 9.

Analysis

IRON AND STEEL

Blast Furnace Gases

Determination of Oxygen in Iron and Steel. William R. Fleming. Explains the shortcomings of the Ledebur method and its modifications. Ills. 2500 w. *Ir Age*—June 26, 1913. No. 43240 C.

Determination of Chromium in Steel. Frank Garrett. Gives a colorimetric method for the determination of chromium in steel, particularly suited to small percentages. 1500 w. *Ir Age*—April 10, 1913. No. 41153 C.

The Determination of Vanadium in Ferro-Vanadium. William W. Clark. Comments on methods used and description of a method found to be accurate under all conditions and on all varieties of work. 2500 w. *Met & Chem Engng*—April, 1913. No. 41045 C.

Determination of Phosphorus in Steels Containing Vanadium. J. R. Cain and F. H. Tucker. Gives results of experimental investigations. 11 pp. *Tech Papers of Bureau of Stand*—No. 24. No. 43336 N.

Method for the Rapid Determination of Total Carbon in Iron, Steel, Cast-Iron, and in the Iron Alloys. H. de Nolly. Read before the Int. Assn. for Test. Mat. Describes a method having all the advantages of the dry method, and, from the point of view of rapidity, is superior to the Eggertz calorimetric process. Ills. 1500 w. *Chem Engng*—July, 1913. No. 43860 C.

Analyzed Iron and Manganese Ores—Methods of Analysis. Gives methods of analysis at the Bureau of Standards, and methods used by other analysts. 8000 w. *Bureau of Stand*—Circ No. 26. No. 44739 N.

Analyzed Irons and Steels—Methods of Analysis. Gives methods for iron and ordinary steels, and methods for special alloy steels. 5800 w. *Bureau of Stand*—Circ. No. 14. No. 44738 N.

Determination of Oxygen in Iron and Steel. Describes methods of estimation followed in recent investigations. 1800 w. *Ir Age*—Aug. 7, 1913. No. 44201 C.

Annealing

The Influence of Divorcing Annealing on the Mechanical Properties of Low-Carbon Steel. Henry M. Howe and Arthur G. Levy. Reports an investigation made to determine whether the structural change which occurs in the slow cooling of steel below the transformation range has an important effect on its engineering properties. Ills. 9000 w. *Bul Am Inst of Min Engrs*—Jan., 1913. No. 39443 F.

Belgium

Historical Survey of the Metallurgy of Iron in Belgium. Baron E. De Laveleye. Read before the Iron & Steel Inst. An

interesting review. 9500 w. *Ir & Coal Trds Rev*—Sept. 5, 1913. No. 45182 A.

Bessemer Process

The Bessemer Process at Königshütte (Das Bessemerwerk der Königshütte). Hermann Illies. A historical review in commemoration of the 100th anniversary of the birth of Henry Bessemer. Ills. 4900 w. *Stahl u Eisen*—Feb. 6, 1913. No. 40504 D.

Bessemer Steel

Starting Bessemer Steel Making in America. Robert W. Hunt's speech of acceptance of John Fritz medal for 1912. 1500 w. *Ir Age*—Dec. 12, 1912. No. 38167 C.

Blast-Furnace Gases

Cleaning Blast-Furnace Gases (Eparation des Gaz de Haute-Fourneaux). A. Gouvy. Presents designs of gas-cleansers for preliminary, primary and secondary degrees of cleaning, with examples of actual design. Ills. 1100 w. *Rev de Metall*—Oct., 1912. No. 37497 H.

Determining Heat-Value of Blast Furnace Gas. J. F. Mowat. Explains how the three factors necessary for making calculations are obtained by the use of curves. 1500 w. *Ir Trd Rev*—Jan. 2, 1913. (Special.) No. 38738 D.

Modern Practice in Cleaning Blast-Furnace and Other Gases. H. Stone-wall Jackson. Abstract of a paper read before the Cleveland Inst. of Engrs. Describes methods adapted at different plants. 3000 w. *Ir & Coal Trds Rev*—April 11, 1913. No. 41398 A.

Blast-Furnace Gas as a Heat Medium in Foundries and Drying Rooms (Hochofengas als Heizmittel für Giessereien und Trockenkammern). Paul Zimmermann. Suggestions and plans for heating by this waste fuel. Ills. 1400 w. *Giess Zeit*—April 1, 1913. No. 41426 D.

The Theoretical Effect of Increasing the Oxygen of the Blast Supplied to Blast Furnaces. Charles A. Edwards. Read before the Cleveland Inst. of Engrs. Reports an investigation of the net theoretical effect of increasing the oxygen of the blast in blast furnaces. Discussion. 5000 w. *Ir & Coal Trds Rev*—Jan. 17, 1913. No. 39490 A.

Studies on the Prevailing Conditions Between Iron Ore and Gases in Blast Furnaces (Studien über die im Hochofen zwischen den Eisenerzen und Gasen obwaltenden Verhältnisse). Norbert Metz. A study of the chemical reactions occurring in the blast furnace. Ills. and charts. 6300 w. *Stahl u Eisen*—Jan. 16, 1913. No. 40005 D.

The Value of Blast-Furnace Gases (Die Bewertung von Hochofengasen). H. Tha-

Consult Classification of the Index. See page 9.

Blast-Furnace Gases

IRON AND STEEL

Blast Furnaces

ler. Studies on the available heat energy in flue gases. 2800 w. Oest Zeit f Berg u Hütten—Feb. 8, 1913. No. 40509 D.

Dust Determination for Blast-Furnace Gas. Everard Brown. Explains several methods employed. Ills. 1500 w. Power—May 13, 1913. No. 42017.

Purification of Blast-Furnace Gas by the Schwarz-Bayer Process (Die Hoch-ofengasreinigung nach der Verfahren Schwarz-Bayer). Fritz Häring. Brief description of the claims for this process, and the disintegrator forming the essential element. Ills. 1000 w. Stahl u Eisen—April 17, 1913. No. 42110 D.

Automatic Gas Regulation in Metallurgical Practice (Selbsttätige Gasregelung in Hüttenbetrieben). Immo Glenck. Details of a pressure regulator applied to Cowper, Martin, and other furnaces. Ills. 3000 w. Stahl u Eisen—May 8, 1913. No. 43001 D.

The Purification of Blast Furnace Gases. A report of a paper by C. Herwegh, giving data on the use of the Feld washer in French blast furnace practice. Also details of a proposed American installation. Ills. 4000 w. Met & Chem Engng—July, 1913. No. 43488 C.

The Utilization of Blast-Furnace and Coke-Oven Gases in Metallurgy. E. Houbner. Reviews the practical applications of these two gases to metallurgy, especially their employment for heating metal mixers, open-hearth furnaces, and reheating furnaces. Ills. 10000 w. Iron & Steel Inst, No. 9—Sept., 1913. No. 45094 N.

The Cleaning of Blast Furnace Gas. W. A. Forbes. Shows the advantages of cleaning blast-furnace gas where dusty gases are produced, and describes the various systems by which the cleaning can be accomplished. Ills. 9000 w. Bul. Am Inst of Min Engrs—Oct, 1913. No. 46351 F.

See also Gas Firing, under MECHANICAL ENGINEERING, *Steam Engineering* and Gas Engines, under MECHANICAL ENGINEERING, *Combustion Motors*.

Blast-Furnace Practice

See Chip Briquetting, under MECHANICAL ENGINEERING, *Machine Works and Foundries*.

Blast Furnaces

Novel Type of Blast Furnace Construction. J. E. Johnson, Jr. Describes the design and construction of structural steel framework supported by four steel columns for carrying the weight of the entire furnace. Ills. 2200 w. Ir Trd Rev—Nov. 7, 1912. No. 37323.

Blowing-In a Blast Furnace. R. H. Sweetser. An account of a blowing-in

practice where the results are sure, safe and satisfactory. Ills. 2500 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37894 F.

Developments in the Preparation of Iron Ores. J. W. H. Hamilton. Read before the Am. Ir. & St. Inst. Discusses the processes employed to increase the iron content of the blast furnace burden and the utilization of fine ores and flue dust. 5500 w. Ir Trd Rev—Nov. 28, 1912. No. 37931.

New Blast Furnaces of the Maryland Steel Co. Drawings and description of the general arrangement of blast furnace "A" and details of design. 1500 w. Ir Trd Rev—Jan. 23, 1913. No. 39320.

Means of Preventing Outbreaks of Iron in Blast Furnaces (Ueber Mittel zur Verhütung von Roheisendurchbrüchen bei Hochofen). R. Kunz. Presents modified design of blast furnaces to overcome this tendency. Discussion. Ills. 6300 w. Stahl u Eisen—Jan. 23, 1913. No. 40008 D.

The Caen Blast Furnaces (Les hauts-fourneaux de Caen). Robert Le Chatelier. A review of the general conditions in this steel region of France. Maps. 4500 w. Rev de Metal—Feb., 1913. No. 40076 E + F.

New Type of Blast-Furnace Construction. J. E. Johnson, Jr. Critical discussion of blast-furnace construction, with description of a design. Ills. 3500 w. Bul Am Inst of Min Engrs—March, 1913. No. 40891 F.

The Blast-Furnaces and Steel Works at Caen (Les hauts fourneaux et aciéries de Caen). A study of the mineral formation of the district, the arrangement of plants and types of furnaces. Ills. 5500 w. Genie Civil—March 1, 1913. No. 40598 D.

Blowing-in a Blast-Furnace. Discussion of the paper of R. H. Sweetser. 3500 w. Bul Am Inst of Min Engrs—May, 1913. No. 42464 F.

The Caen Blast-Furnace Plant. Brief review of the history and illustrated description of the plant. 2000 w. Ir & Coal Trds Rev—April 25, 1913. No. 41935 A.

Thermo Economics of Blast Furnaces; Their Dependence Upon Convertible Reduction Processes, and Their Calculable Thermo-Dynamic Free Formative Energy (Die Thermoökonomie des Eisenhoch-ofens, ihre Abhängigkeit von den umkehrbaren Reduktionsprozessen und deren thermodynamisch berechenbaren freie Bildungsenergien). L. P. Friedrich. Mathematical discussion with diagrams.

Consult Classification of the Index. See page 9.

Blast Furnaces

5000 w. Feuerungs—May 1, 1913. No. 42129 D.

The Development of Blast-Furnace Construction at the Boston & Montana Smelter. J. A. Church. Early furnaces; experiments with high-shaft, wide, and extreme bosh furnaces; the 56 by 180 inch furnace, and recent experiments. Ills. 8500 w. Bull Am Inst Min Engrs—July, 1913. No. 44022 F.

Thermal Effect of Blast-Furnace Jackets. Robert P. Roberts. An account of a series of tests at Great Falls, Mont., and tabulated results. Ills. 9000 w. Bull Am Inst Min Engrs—July, 1913. No. 44021 F.

Lowering Furnace-Flux Costs. C. A. Tupper. Illustrates and describes a plant designed to secure the highest efficiency. 2500 w. Min & Engng Wld—June 28, 1913. No. 43318.

Developments in Lining Blast Furnaces. C. A. Tupper. Explains the advantages of thin-lined, water-cooled furnaces. Ills. 2500 w. Ir Trd Rev—Sept. 4, 1913. No. 44952.

On the Use of Oxygen in Blast-Furnace Practice. Gustave Trasenster. Brief account of the experiments made by the Ougrée-Marihaye Company. 1200 w. Iron & Steel Inst, No. 17—Sept., 1913. No. 45096 N.

Reinforced Pile Foundations for Blast Furnaces. Armand Baar. Read before the Iron & Steel Inst. Brief description of a new system known as Franki piles. Ills. 1000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45186 A.

Researches on Blast-Furnace Phenomena (Untersuchungen über die Vorgänge im Hochofen). W. Mathesius. A study of the chemical reactions occurring within the furnace. Diagrams. Serial, 1st part. 5200 w. Stahl u Eisen—Sept. 4, 1913. No. 45381 D.

The Use of Nodulized Ore in the Blast Furnace. Richard Henry Lee. Discusses important points in working blast furnaces on nodulized ore. 3300 w. Bull Am Inst of Min Engrs—Oct, 1913. No. 46352 F.

The New Blast Furnace at Port Colborne, Ont. Brief illustrated description of the new furnace at the Lake Erie entrance of the Welland Canal. 1500 w. Ir Age—Oct. 2, 1913. No. 45599 C.

See also same heading, under *Lead and Zinc*.

Blast-Furnace Slags

The Effect of Alumina in Blast-Furnace Slags. Discussion of the paper of J. E. Johnson, Jr. 4000 w. Bull Am Inst of Min Engrs—Dec., 1912. No. 38376 F.

IRON AND STEEL**Cast Iron**

Blast-Furnace Slag—Analyses for 24 Hours. F. L. Grammer. Gives a comparative record of a day's run of furnaces on basic and Bessemer irons, with notes. 500 w. Bul Am Inst of Min Engrs—March, 1913. No. 40901 F.

The Value of Blast-Furnace Slag (Die Verwertung der Hochofenschlacke). E. Elwitz. The production of cement from slag and its application. Ills. 2100 w. Glückauf—May 31, 1913. No. 43009 D.

Blowing Engines

2000 H. P. Gas-Driven Blowing Engine (2000-PSe Gasgebläsemaschine). Eduard Kaschny. Data on machine erected by the Maschinenfabrik Augsburg-Nürnberg. Ills. & Plate. 2200 w. Elek Rund—Dec. 12, 1912. No. 39055 D.

Canada

Moose Mountain Iron Mine. F. A. Jorjon. Describes the ores and deposits, giving an account of the development. 3000 w. Can Min Jour—Dec. 1, 1912. No. 38043.

The Production of Iron and Steel in Canada During the Calendar Year 1911. John McLeish. Advance chapter from annual report on the mineral production of Canada. 8500 w. Can Dept of Mines—No. 182. No. 39539 N.

The Undeveloped Iron Resources of Canada. A. B. Willmott. Discusses the types of iron ore deposits, and describes the various deposits of the different provinces. 6500 w. Jour Can Min Inst—Vol. XIV. No. 42026 N.

Cast Iron

Malleable Cast Iron and the Open Hearth Furnace. G. A. Blume. Briefly reviews changes that have produced astonishing results and discusses the experience of the author with open hearth furnaces. Ills. 7000 w. Am Found Assn—Dec., 1912. No. 38621 N.

The Cleansing Effect of Titanium on Cast Iron. Bradley Stoughton. Gives results of research and of a series of tests upon the effect of titanium on steel castings. Also discussion. 7000 w. Am Found Assn—Dec., 1912. No. 38613 N.

The Production of "Inside Chill" and the Hardening of Cast Iron by Air Blasts (Die Erzeugung "umgekehrten Hartgusses" und die Härtung von Gussteilen durch Gebläseluft). Bernhard Osann. Discusses the papers by Thos. D. West read before the Am. Soc. of Mech. Engrs. Ills. 2100 w. Stahl u Eisen—Oct. 31, 1912. No. 38401 D.

The Constitution of Cast-Iron and the Effects of Superheated Steam. William Campbell and John Glassford. An examination of corroded cast-iron from a super-heater showed that the metal had

Cast-Iron

become oxidized following the planes of the graphite flakes. Gives results of experiments. Ills. 5000 w. Am Found Assn—Dec., 1912. No. 39522 N.

Typical American Uses of Cast-Iron, and Test Methods Applicable to Them. John Jermain Porter. Read before the Int. Assn. for Test. Mat. Discusses characteristics, uses and the properties needed, and tests necessary. 3000 w. Chem Engr—Dec., 1912. No. 38819 C.

New Method for Mechanical Tests on Cast-Iron. C. Frémont. Compares different methods of applying mechanical tests, presenting results of supplementary tests. 1500 w. Am Found Assn—Dec., 1912. No. 39525 N.

Cleansing Effect of Titanium on Cast Iron. Bradley Stoughton. Read before the Am. Found. Assn. Reports researches showing that titanium introduced into cast iron does not produce an alloy until fixed percentages are exceeded. 2000 w. Ir Trd Rev—Feb. 20, 1913. No. 39963.

Notes on Cast-Iron. Albert Sauveur. Notes, suggested by J. E. Johnson's paper, on the physical properties of cast-iron vs. its ultimate composition, etc. Ills. 6000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40904 F.

Cast-Iron. Discussion of the paper of J. E. Johnson, Jr., and of the paper of Albert Sauveur. Ills. 8500 w. Bul Am Inst of Min Engrs—May, 1913. No. 42467 F.

The Influence of the Metalloids on the Properties of Cast-Iron. H. I. Coe. Describes research work dealing with the effect of metals not usually present in cast-iron or the iron carbon alloys, to ascertain by comparison the utility of adding these materials to cast-iron. Ills. 3000 w. Ir & St Inst—May, 1913. No. 42237 N.

The Numerical Classification of Cast Iron Seems Insufficient—A Chemical Classification (Classification numérique des fontes de moulage son insuffisance—Classification chimique). Th. Gueneau. A proposed French classification as hematite, common foundry, basic and special cast iron. 3000 w. Rev de Metall—Aug., 1913. No. 45315 H.

Cast Iron and Malleable Iron (Fonte et fonte malléable). W. H. Hatfield. An examination of these materials from a microscopical point of view. Plate. 3000 w. Rev de Metall—Aug., 1913. No. 45319 H.

Notes on the Investigation of Cast Iron (Beitrag zur Untersuchung des Gussstahls). C. Jüngst. A review of experimental methods to be followed in making

IRON AND STEEL

China

tests. Ills. 3000 w. Stahl u Eisen—Aug. 28, 1913. No. 45379 D.

Cast Iron Specifications and Inspection. R. S. McPherran. A plea for uniformity. 800 w. Am Found Assn—Oct., 1913. No. 46258 N.

Calculating Mixtures for Malleable Cast Iron. Harrold Hemenway. Gives a rapid and easy method for figuring the heats. 2500 w. Foundry—Oct., 1913. Special. No. 45711 C.

The Changes in Volume of Cast Iron under Heat and Its Application (Die Volumenänderung des Gusseisen in Wärme und Nutzenwendungen). A. Messerschmitt. Studies and tables on the amount of expansion and the uses to which this expansion may be placed. Serial, 1st part. 2500 w. Giess Zeit—Oct. 1, 1913. No. 46024 D.

See also Castings, under MECHANICAL ENGINEERING, Machine Works and Foundries.

Charcoal-Iron

The Effect of High Carbon on the Quality of Charcoal-Iron. J. E. Johnson, Jr. Briefly reviews the commercial conditions governing the charcoal-iron industry, explains its quantitative importance and the factors that affect the quality. Also discussion. Ills. 1400 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40155 F.

Chile

The Tofo Iron Mines in Coquimbo, Chile. Information concerning the character and extent of the deposits and methods of working and shipping. 1200 w. Ir Age—Feb. 13, 1913. No. 39838 C.

The Extent of the Chilean Iron Ore Deposits. Analyses of the Chilean ores and information concerning the different provinces. 3000 w. Ir Trd Rev—Feb. 20, 1913. No. 39962.

Iron Ore Resources of Chili. Part II. Charles Vattier and Nicomedes Echegarai. A continuation of a paper read last year before the Iron & Steel Inst., giving a report of recent investigations. 7000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45193 A.

China

Native Iron and Steel Practice in China. Albert B. Middleton. Reports results of research work on materials and samples. 1800 w. Ir & Coal Trds Rev—May 23, 1913. No. 42762 A.

The Tayeh Iron Mine, China. Kimio Nishizawa. Remarks on the effects of Chinese revolutions on the mining industry, and of foreign loans, with history and description of the Tayeh iron mine. 3000 w. Jour Soc of Arts—Oct. 10, 1913. No. 45966 A.

Consult Classification of the Index. See page 9.

Chrom

IRON AND STEEL

Efficiency-Records

Chrom

The World's Chrome Mines. Information concerning the deposits, the uses of the ore, and matters related. 1500 w. Min Jour—Oct. 11, 1913. No. 45978 A.

Concentration

The Concentration of Iron Ores. N. V. Hansell. Deals with the various methods at present commercially used in the United States, showing the present status of the art and the possibilities for further development. Ills. 7500 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38372 F.

The Concentration of Iron-Ores. Discussion of the paper by N. V. Hansell. 2000 w. But Am Inst of Min Engrs—May, 1913. No. 42463 F.

Concentrator

An Iron Concentrator of Unusual Design. L. O. Kellogg. Describes a concentrating plant in the Hudson Highlands employing permanent magnets which deflect the iron from a falling curtain of ore. Ills. 1500 w. Eng & Min Jour—Aug. 9, 1913. No. 44246.

Converters

Converter for Melting Iron and Blowing Steel. Illustrated description of the first American installation of the stock oil-fired converter for making steel for castings. 1800 w. Foundry—Jan., 1913. No. 38708.

A Two-Piece Small Type Converter. A. F. Blackwood. Illustrated description of a two-piece converter, which saves time in making repairs. 1500 w. Ir Age—Jan. 30, 1913. No. 39585 C.

Corrosion

The Corrodibility of Nickel, Chromium, and Nickel-Chromium Steels. J. Newton Friend, Walter West, and J. Lloyd Bentley. Gives results of experiments in which samples were exposed to corrosive influences for six months. 2200 w. Ir & St Inst—May, 1913. No. 42239 N.

The Influence of Silicon on the Corrosion of Cast-Iron. J. Newton Friend and C. W. Marshall. Report of experimental tests and discussion of results. 1000 w. Ir & St Inst—May, 1913. No. 42240 N.

Crucible Steel

The Manufacture of Crucible Steel. John Howe Hall. Brief review of the history and processes, describing the furnaces, pouring and casting, etc. Ills. 3000 w. Ir Trd Rev—April 3, 1913. Serial. 1st part. No. 41061.

Cuba

The Vast Ore Deposits of Cuba. Henry Hale. Information concerning the deposits of iron, accessible without tunneling or shafting, aggregating 500,000,000

tons or more. Ills. 1500 w. Sci Am—Aug. 23, 1913. No. 44498.

See Ore Deposits, under *Iron and Steel*.

Cupola Furnaces

Fuel-Efficiency of the Cupola Furnace. John Jermain Porter. Indicates the laws governing the fuel-economy of the cupola, and examines the feasibility of some of the proposals for increasing its fuel-economy. 2500 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40158 F.

Experimental Investigations of Cupola Furnace Melting Processes (Experimentelle Untersuchung des Kupolofen-Schmelzprozessen). Fried. Hüser. Studies of the gas and temperature conditions in these furnaces. Ills. 5600 w. Stahl u Eisen—Jan. 30, 1913. No. 40009 D.

Cupolas

Studies of the Cupola Melting Process. From a paper by Dr. F. Hüser, in *Stahl und Eisen*. Tests of iron and slag were taken at intervals throughout the operation. Ills. 1200 w. Ir Age—March 27, 1913. No. 40888 C.

Desulphurization

The Desulphurization of New Jersey Iron Ore. Describes an adaptation of the wedge kiln, used for roasting copper ores, to the desulphurization of Eastern iron ores. Ills. 1500 w. Ir Tr Rev—Jan 30, 1913. No. 39588.

The Desulphurization of Iron, Laws and Their Application (Die Entschwefelung des Eisens, ihre Gesetze und deren Anwendung). W. Heike. A statement of the laws and practical means for obtaining the desired results. Serial. 1st part. 3000 w. Stahl u Eisen—May 8, 1913. No. 43000 D.

Dry Blast

The Story of the Dry-Blast Process. James Gayley. Address on the occasion of the presentation of the Perkin medal. 4500 w. Met & Chem Engng—Feb., 1913. No. 39680 C.

The Gayley Dry Blast Process. Henry M. Howe. Extracts from the address made at the presentation of the Perkin medal to Dr. James Gayley, 2200 w. Met & Chem Engng—March, 1913. No. 40333 C.

The Economy of Dry Blast. Josef von Ehrenwerth. Reviews results obtained in research work. 2500 w. Ir & St Inst—May, 1913. No. 42238 N.

The Gayley Dry Blast Process. Oliver W. Storey. A sketch of Mr. Gayley's life and the development of the process. 2000 w. Wis Engr—Oct., 1913. No. 46312 C.

Efficiency-Records

The Utility of Efficiency-Records in the Manufacture of Iron. John Jermain

Consult Classification of the Index. See page 9.

Electric Furnaces

IRON AND STEEL

Electrometallurgy

Porter. Gives some examples of efficiency-reports as applied to blast-furnace operations. 3000 w. *Bul Am Inst of Min Engrs*—April, 1913. No. 41656 F.

Electric Furnaces

The Status of the Electric Steel Furnace. Wilfred Sykes. Read before the Assn. of Iron & Steel Elec. Engrs. Discusses various furnaces and their future development. The arc type is considered preferable from an operating standpoint. 3000 w. *Ir Age*—Oct. 16, 1913. No. 45915 C.

Electric Furnace Heat-Treatment of Steel. E. F. Lake. Illustrates and describes the arrangement of the electric furnace, discussing the effect of different elements absorbed by heated steel. 3500 w. *Mach, N Y*—Oct. 1913. No. 45607 C.

The Frick Electric Steel Induction Furnace. Reports results achieved at the Krupp plant at Essen, comparing with other furnaces and considering the future of the electric furnace. Ills. 4000 w. *Ir Age*—Oct. 2, 1913. No. 45600 C.

Induction-Furnace Notes. Joh. Hårdén. Gives details and readings on an induction-furnace plant, as an example of what can be done in this class of furnaces when used for high-class crucible steel making. 3500 w. *Met & Chem Engrg*—Oct. 1913. No. 45780 C.

The Induction-Furnace for Crucible Steel-Making. John Hårdén. Notes of details and readings on an induction furnace plant given as an example of what can be done in this class of furnaces. 4000 w. *Ir & Coal Trds Rev*—Oct. 3, 1913. No. 45871 A.

The Induction Furnace and Its Use in the Manufacture of Steel. Albert Hiorth. Describes the furnace invented by the author and gives data. Ills. 3000 w. *Am Found Assn*—Oct., 1913. No. 46263 N.

A Canadian Electric Steel Furnace. T. R. Loudon. Illustrated description of the plant. 1500 w. *Can Engr*—Oct. 23, 1913. No. 46191.

Advances in the Construction and Operation of Electric Blast Furnaces (*Fortschritte im Bau und Betrieb elektrischer Hochofen*). W. Rodenhauser. Description of the types introduced during the past year. Ills. 5000 w. *Elek Kraft u Bahnen*—Sept. 24, 1913. No. 46093 D.

Electric Power

The Use of Electric Power in Steel Mills. Stewart C. Coey. Read before the Am. Ir. & St. Int. Gives a comparison of methods of production and distribution, and discusses the question of alternating or direct current motors. Discussion.

5000 w. *Ir Age*—Oct. 31, 1912. No. 87747 C.

The Selection and Care of Electrical Machinery in Steelworks. J. Arthur Sykes. Discusses care necessary to maintain efficient service under such hard conditions. Ills. 6000 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38849 D.

Electric Control Gear for Iron and Steel Works. J. M. L. Slater, and F. C. Hall. Discusses power station switchboards and control gear for blast furnace hoists, reversing mills, continuous mills and auxiliaries. 7500 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38848 D.

Types of Motor for Steel Mill Auxiliaries. B. R. Shover and E. J. Cheney. From a paper before the Assn. of Ir. & St. Elec. Engrs. The factors to be considered in deciding the system to be used. 3500 w. *Ir Trd Rev*—Jan. 23, 1913. No. 39319.

Electricity in Iron and Steel Mills. Considers the advantages, cost, applications, etc. Ills. 6000 w. *Elec Rev & W Electr'n*—Feb. 22, 1913. No. 39991.

Electricity in Iron and Steel Industry. J. E. Dalemont. Discusses briefly the recent consumption of blast furnace gas in gas engines, and the direct drive of reversible rolling mills by electric motors. Ills. 1000 w. *Can Engr*—March 13, 1913. No. 40680.

See also Cranes, under **MECHANICAL ENGINEERING**, *Transporting and Conveying*, and Rolling Mills, under *Iron and Steel*.

Electrolytic Refining

Electrolytic Production of Iron Sheets and Tubes, Etc. Wilhelm Palmer and J. A. Brinell. Gives results of a study of the S. Cowper-Coles electrolytic method for producing iron sheets and tubes, etc. 6500 w. *Met & Chem Engrg*—April, 1913. No. 41046 C.

Electrometallurgy

Electric Iron-Smelting at Trollhättan. Deals especially with the chemical side of the problem. 6000 w. *Engng*—Nov. 8, 1912. No. 37638 A.

Iron and Steel Smelting in Electro-Metals Furnaces. T. D. Robertson. Discusses electrical iron ore reduction and describes the electro-metals steel-refining furnace. 6000 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38857 D.

Tool Steel from Titaniferous Magnetite by Evans-Stansfield Electric Furnace Process. J. W. Evans. An account of the development of the process, the results, and costs. 1500 w. *Jour Can Min Inst*—Vol. XV. No. 42037 N.

Extension of Hydro-Metallurgical Industries. Baxeres de Alzugaray. Discusses the application of hydrometallur-

Consult Classification of the Index. See page 9.

Electrometallurgy**IRON AND STEEL****Hardening**

gical methods to the extraction of metals. 2500 w. *Min & Engng Wld*—May 17, 1913. No. 42233.

Electric Steel Manufacture from an Industrial Viewpoint (Die Elektro-stahl-Erzeugung vom Gesichtspunkte der Grossindustrie). W. Eilender. A study of the economic features attending the operation of electric furnaces. Discussion. Ills. 4200 w. *Stahl u Eisen*—April 10, 1913. No. 42107 D.

The Determination of Oxygen in Iron and Steel by Reduction in an Electric Vacuum Furnace. William H. Walker and Walter A. Patrick. Read before the Int. Cong. of Ap. Chem. Outlines methods that have been tried and proposed and describes the method named. 2500 w. *Chem Engr*—June 1, 1913. No. 43162 C.

Electric Steel Production and Its Expansion. W. Eilender, in *Stahl und Eisen*. A German discussion from the large industry point of view. A comparison of acid and basic steels from the Heroult furnace. 3000 w. *Ir Age*—June 5, 1913. No. 42660 C.

The Electric Production of Steel. Illustrated review covering the time from the early experiments of Siemens to the 30-ton furnace of to-day. 2500 w. *Sci Am*—Aug. 2, 1913. No. 44073.

Electric Steel Furnaces in Sheffield. Information concerning electric furnaces in operation, with special reference to Messrs. Darwin and Milner's tool steel furnace. Ills. 3000 w. *Elec Rev, Lond*—July 25, 1913. No. 44163 A.

New Developments in the Electric Production of Pig Iron in Scandinavia (Neueres aus der Elektro-Roheisenerzeugung Skandinaviens). A. Beilstein. A statement of the latest improvements and a summary of the output of the region. 5600 w. *Stahl u Eisen*—July 31, 1913. No. 44611 D.

See Electric Furnaces, and Electrometallurgy, under ELECTRICAL ENGINEERING, *Electro-Chemistry*; Furnaces, under MECHANICAL ENGINEERING, *Machine Works and Foundries*; Refining, and Smelting, under Iron and Steel.

Flue Dust

The Reclamation of Flue Dust for Furnace Use. Albert F. Plock. A discussion of the nodulizing, briquetting, and sintering processes. 1500 w. *Ir Trd Rev*—May 1, 1913. No. 41795.

Furnace Firing

Firing for Direct Steel Manufacture (Feuerung für direkte Stahlerzeugung). Carl Otto. A review of methods practised in the past in comparison with present precise methods. 3500 w. *Feuerungs*—April 15, 1913. No. 42128 D.

Furnaces

Some Fundamental Faults of Present-Day Furnaces and Their Remedies. Alayne Reynolds. Considers briefly the principles of combustion, and explains devices of the author's for securing complete combustion. Ills. 10000 w. *Ir & St Inst*—May, 1913. No. 42245 N.

The Process of Combustion in Reverberatory Furnaces (Ueber die Verbrennungsvorgänge in Giessereiflammöfen). Bernhard Osann. Results of combustion tests extending over eighteen hours. 1400 w. *Stahl u Eisen*—April 24, 1913. No. 42111 D.

Gas Cleaning

Apparatus for Catching Cinders in Gases. Illustrated description of a method found efficient by the New York Edison Co. 2500 w. *Ir Age*—Sept. 11, 1913. No. 45060 C.

Geology

Use of Geology in Iron Ore Exploration. C. K. Leith. Discusses plans of exploration desirable from a geologic standpoint, referring to Lake Superior, Canada, Cuba and Brazil. 5500 w. *Ec-Geol*—Oct.-Nov., 1912. No. 38503 D.

Greece

Chromiferous Iron Ores of Greece and Their Utilization. Herbert K. Scott. Information concerning the Greek deposits with suggestions for their utilization. Maps & Ills. 4000 w. *Ir & St Inst*—May, 1913. No. 42248 N.

Hardening

The Hardness of Metals. Thomas A. Eastick. Describes hardness and methods of hardening, with related subjects. Ills. 2500 w. *Sci Am Sup*—May 3, 1913. No. 41783.

The Cold-Working of Metals (Sur l'écroutissage des métaux). M. Hanriot. A comparative study of results of alloys of differing constituencies. Ills. 4800 w. *Tech Mod*—May 1, 1913. No. 42177 D.

On Cold Working (Sur l'écroutissage). M. Hanriot. Theories advanced and definitive qualities suggested on annealing, tempering and cold-working. Ills. 5500 w. *Rev de Metal*—May, 1913. No. 42189 H.

Cold Working (De l'écroutissage). M. P. Galy-Aché. Presenting opinions on the structural changes effected in the material so hardened as differing from opinions by MM. Le Chatelier and Guillet. 4500 w. *Rev de Metal*—May, 1913. No. 42188 H.

The Influence of Cold-Working on the Properties of Steel (Influence de l'écroutissage sur les propriétés de l'acier). M. P. Goehrens. A series of tests to determine the elasticity, resistance, hardness,

Heat Treatment

IRON AND STEEL

Ingots

specific weight, electric properties, etc., on metal so worked. Ills. 56 pp. Rev de Metal—May, 1913. No. 42190 H.

Researches on the Annealing of Cold-Worked Products (*Recherches sur le recuit des produits écrouis*). Léon Guillet. Results of an extensive series of tests. Diagrams. 2500 w. Rev de Metal—May, 1913. No. 42191 H.

Hardening and Tempering Steel. A review of the general requirements and characteristics of quenching and tempering baths. Ills. 3000 w. Mach, N Y—Oct., 1913. No. 45605 C.

See also Annealing, under MECHANICAL ENGINEERING, Machine Works and Foundries.

Heat Treatment

Microscopic Revelations of Steel Structures. E. F. Lake. Illustrated study of structural changes due to heat-treatment. 4000 w. Mach, N Y—May, 1913. No. 41789 C.

The Tenacity, Deformation, and Fracture of Soft Steel at High Temperatures. Walter Rosenhain and J. C. W. Humphrey. Gives results of an investigation of the mechanical behavior of iron and high temperatures. Ills. 13000 w. Ir & St Inst—May, 1913. No. 42247 N.

Influence of Mass in Heat-Treatment of Steel. K. W. Zimmerschild. Read before the Am. Soc. for Test. Mat. Gives results of experiments with explanations. 14000 w. Ir Trd Rev—July 10, 1913. No. 43602.

The Reducibility of Metallic Oxides as Affected by Heat Treatment. Woolsey McCa. Johnson. A study of the requisite preparation of oxides for reduction as indicated by the Johnson "reaction tester." Ills. 2800 w. Bull Am Inst Min Engrs—July, 1913. No. 44006 F.

Heat-Treated Automobile Frame Steel. D. K. Bullens. A comparison of alloy and carbon steels. Ills. 3000 w. Ir Age—July 24, 1913. No. 43847 C.

See also Case Hardening, and Castings, under MECHANICAL ENGINEERING, Machine Works and Foundries.

India

The Origin of the Iron Industry in India and the Development of the Tata Iron and Steel Co. (*Die Grundlagen der Indischen Eisenindustrie und die Entwicklung der Tata Iron and Steel Co.*). Axel Sahlin. A brief historical summary of conditions. Ills. 5000 w. Stahl u Eisen—Feb. 13, 1913. No. 40500 D.

Ingots

Influence of Pouring on Quality of Steel. Abstract translation of an article by Dr. C. Canaris. A study of ingot defects, their origin, and their effect up-

on steel rolled into plates. 2500 w. Ir Age—Dec. 5, 1912. No. 38040 C.

The Influence of Pouring on the Quality of Mild Steel Blooms (*Ueber den Einfluss des Giessens auf die Qualität von Flusseisenbrammen*). C. Canaris. Discusses the main effects of bad castings; contraction, piping, segregation, blow holes, surface blisters and scale. Ills. Serial. 1st part. 1400 w. Oest Zeit f Berg u Hüttenwesens—Nov. 16, 1912. No. 38414 D.

Welding Blow-Holes and Blisters in Steel Ingots (*Das Zusammenschweißen von Blasen und Hohlräumen in Stahlblöcken*). G. Goldberg. Describes process, gives formula for satisfactory compound and discusses results. 2800 w. Giess-Zeit—Nov. 15, 1912. No. 38424 D.

Slag Enclosures (*Les "inclusions de scories"*). Walter Rosenhain. Report presented before the Sixth Congress of the International Association for Testing Materials. Ills. 7000 w. Rev de Metall—Dec., 1912. No. 38485 H.

Slag-Enclosure. Dr. Walter Rosenhain. Deals with the subject under the headings of nomenclature; study of the constitution of the enclosures; the mode of formation and origin and suggested methods of prevention; distribution in steel and their effects on the properties; and suggested directions for further investigation. Ills. 7000 w. Am Found Assn—Dec., 1912. No. 39519 N.

Method of Producing Sound Ingots. W. C. Cushing. Explains the cause of piping in ingots; and reprints two papers by Sir Robert Hadfield, read before the Iron and Steel Inst on "Methods of Producing Sound Ingots," and Segregation in Steel Ingots. Discussion. Ills. 14000 w. Bul Am Ry Engrg Assn—Nov., 1912. No. 39560 N.

The Non-Metallic Impurities Found in Steel. Considers the character and sources of slag inclusions. 2000 w. Ir Age—Jan. 23, 1913. No. 39322 C.

Influence of Silicon on Open-Hearth Ingots and Rails. M. H. Wickhorst. Reports an investigation between the limits of .15 per cent. and .54 per cent. silicon, stating results. Ills. 10000 w. Bul Am Ry Engrg Assn—Nov., 1912. No. 39561 N.

Method of Producing Sound Ingots. Information concerning the new process of Sir Robert Hadfield, and results obtained with it in France. Ills. 2200 w. Met & Chem Engrg—Feb., 1913. No. 39683 C.

An Analysis of Steel Ingot Manufacture. Bradley Stoughton. Considers the influence of common defects on the quality of rails and structural material, and

Ingots

means for correcting them. Ills. 5000 w. Ry Age Gaz—Feb. 7, 1913. No. 39714.

The Use of Anti-Piping Thermit in Casting Steel Ingots. E. A. Beck. Describes the new method worked out by the Th. Goldschmidt A. G., Germany. Ills. 2500 w. Bul Am Inst of Min Engrs April, 1913. No. 41664 F.

The Production of Sound Steel Ingots. Leslie E. Howard. Illustrates and describes methods and apparatus of the Simonds Mfg. Co. in producing crucible steel ingots free from pipe and segregation, by compression when fresh from molds. 4500 w. Ir Age—April 24, 1913. No. 41584 C.

Piping and Segregation of Ingots of Steel and Ductility Tests for Open-Hearth Steel Rails. P. H. Dudley. Mainly considers rail steel. Ills. 10500 w. Bul Am Inst of Min Engrs—April, 1913. No. 41667 F.

Commercial Production of Sound Steel Ingots. Emil Gathmann. Describes and illustrates methods of producing sound steel in an economical manner, by rational changes in the methods, casting, cooling and handling of the ingots. 2500 w. Bul Am Inst of Min Engrs—April, 1913. No. 41665 F.

The Talbot Process of Improving Ingots. The paper by Benjamin Talbot, describing the process, with general discussion at the N. Y. meeting. 3500 w. Ir Age—Nov. 14, 1912. No. 37753 C.

Perforated Pipeless Ingots. Benjamin Talbot. Address in N. Y. City describing the Talbot process for making solid ingots. Discussion. 3000 w. Eng News—Nov. 21, 1912. No. 37728.

The Production of Solid Steel Ingots. Benjamin Talbot. Describes ingots produced by the Talbot process. Discussion. Ills. 8000 w. Pro Am Inst of Min Engrs—April, 1913. No. 41663 F.

On the Production of Sound Steel by Lateral Compression of the Ingot Whilst Its Center Is Liquid. Benjamin Talbot. Outlines the method and gives results and conclusions based on the investigation of more than one hundred large ingots. Ills. 5800 w. Ir & St Inst—May, 1913. No. 42249 N.

Plant for Hadfield Method of Producing Sound Steel Ingots. Sir Robert A. Hadfield. Briefly outlines the method and describes plans of working. Ills. 1200 w. Bul Am Inst of Min Engrs—April, 1913. No. 41666 F.

Sound Steel Ingots. Discussion of the papers of Benjamin Talbot, E. A. Beck, Emil Gathmann, Sir Robert A. Hadfield, and P. H. Dudley, presented at the New

IRON AND STEEL

Iron Industry

York meeting, Feb., 1913. Ills. 15000 w. Bul Am Inst of Min Engrs—April, 1913. No. 41668 F.

Influence of Silicon on Open-Hearth Ingots. Report of a series of tests to ascertain the effects of varying amounts of silicon on ingots and rails. Ills. 1800 w. Ir Trd Rev—April 3, 1913. No. 41063.

Shrinkage and Piping of Iron (Schwinden und Lunkern des Eisens). A review of the studies of West, Osann, and others, on the causes and modes of prevention of defects in ingots. Ills. 3100 w. Stahl u Eisen—April 24, 1913. No. 42112 D.

Ingot Iron. An account of the new mill at Middletown, Ohio, and the increased output of this metal, its quality, use, etc. Ills. 2500 w. Ry Age Gaz—July 18, 1913. No. 43802.

Commercial Production of Sound Steel Ingots. Emil Gathmann. Read before the Iron & Steel Inst. Outlines general practice and describes the stripping, ingot-mould and stool, explaining the advantages of the system. Ills. 2500 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45187 A.

The Coefficient of Flow and Its Importance in Tapping in Metallic Ingots (Le coefficient d'écoulement et son importance dans la coulée en linéotières métalliques). M. Portevin. A coefficient with variables based on vent, metal used, and temperature. 1700 w. Rev de Metall—Aug., 1913. No. 45321 H.

Iron Deposits

The Iron Ore Deposits of the Southern States. Edwin C. Eckel. Information concerning the extent of these ore bodies and their formation, with a discussion of their adaptability to the manufacture of steel. Ills. 5000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38744 D.

Lake Superior and Cuban Iron Ores. Day Allen Willey. Information concerning the companies controlling the deposits, with description of the mining and handling methods in Cuba. Ills. 2500 w. Mines & Min—Jan., 1913. No. 38716 C.

Iron Industry

The Iron Industry in the Year 1911 (Das Eisenhüttenwesen im Jahre 1911). B. Neumann. Statistics of production by country and month. Serial. 1st part. 5400 w. Glückauf—Dec. 21, 1912. No. 39008 D.

The Line of Furnace Development of the Southern Iron Industry. John Jermain Porter. A review of progress and account of present conditions. 2500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41551 N.

Consult Classification of the Index. See page 9.

Iron Mining

The Iron and Steel Possibilities of the South. Edwin C. Eckel. Reviews the growth of the industry, 1810-1912, considers the ore supply, coal reserves, and future possibilities. 5000 w. *Mfrs' Rec*—March 27, 1913. (Special.) No. 41552 N.

Iron Mining

Marquette Range Shows Continued Progress. Illustrates and describes recent improvements introduced in the properties, especially the increasing application of electric power. 2500 w. *Min & Engng Wld*—Dec. 7, 1912. No. 38090.

Iron Sands

The Magnetic Iron Sands of Natashkwan, County of Saguenay, Province of Quebec. George C. Mackenzie. Report of an investigation of these magnetic iron sands, with illustrations and maps. 50 pp. *Can Dept of Mines*—No. 145. No. 42999 N.

Ironworks

Charcoal Ironworks. Henry B. Wheatley. Reviews the history of early ironworks in England. 6500 w. *Jour Soc of Arts*—Sept. 19, 1913. Serial, 1st part. No. 45555 A.

Low-Grade Ores

Low-Grade Iron Ores and Their Beneficiation. Dwight E. Woodbridge. Considers various methods of concentration in use and the increase in available reserves. Ills. 3000 w. *Min & Engng Wld*—April 12, 1913. No. 41199.

Magnetite

Magnetite in Mattes and Slags. E. W. Walter. Gives opinions of various authorities as to its formation. 1200 w. *Eng & Min Jour*—Jan. 25, 1913. No. 39376.

Manganese Steel

Heating and Cooling Curves of Manganese Steel. Sir Robert A. Hadfield. Read before the Iron & Steel Inst. An account of a special steel which apparently does not show any critical changes. 1400 w. *Ir & Coal Trds Rev*—Sept. 5, 1913. No. 45183 A.

Metallography

The Microstructure of Iron and Steel. William Campbell. An account of the main features encountered in the microscopic examination of iron and steel. Ills. 7000 w. *Bul Am Inst of Min Engrs*—Dec., 1912. No. 38367 F.

Report on the Progress in Metallography from the Beginning of the Year 1909 to the End of the Year 1911 (*Rapport sur les progrès de la Métallographie depuis le commencement de l'année 1909 jusqu'à la fin de 1911*). E. Heyn. Review of the studies of various metallographists during these years, with refer-

ences to their published statements. Ills. 2100 w. *Rev de Metall*—Dec., 1912. No. 38483 H.

Microscopic Examination of Some Highly-Alloyed Special Steels (Mikroskopische Untersuchung einiger hochlegierten Sonderstähle). Felix Fettweis. A series of metallographic studies. Plates. 2500 w. *Stahl u Eisen*—Nov. 7, 1912. No. 38403 D.

Metallography and Its Application to Railways (Über Metallographie und deren Anwendung im Eisenbahnwesen). Herr Füchsel. A study of the metallurgy of steel rails. Ills. Serial. 1st part. 2800 w. *Glaser's Ann*—Nov. 15, 1912. No. 38432 D.

Crystalline Growth of Strained Ferrite. Albert Sauveur. Read before the Int. Cong. for Test. Mat. An investigation of conditions resulting in brittleness in working metals. Ills. 1500 w. *Ir Age*—Jan. 23, 1913. No. 39325 C.

The Microstructure of Sintered Iron-Bearing Materials. B. G. Klugh. Report of an investigation of the ultimate structure of iron-bearing materials which have been subjected to heat treatment, to determine the relation of the microstructure to its specific susceptibility to the action in the blast-furnace. Ills. 3500 w. *Bul Am Inst of Min Engrs* May, 1913. No. 42458 F.

The Microstructure of Titaniferous Magnetites. Joseph T. Singewald, Jr. A brief statement of the results of a metallographic study of the titaniferous magnetites of the United States. Ills. 2000 w. *Ec-Geol*—April-May, 1913. No. 42322 D.

See also Micrograph, under *Iron and Steel*.

Metallurgy

Electric Heating and the Removal of Phosphorus from Iron. Albert E. Greene. Explains the Metallurgical reactions by which phosphorus can be removed from iron, showing the necessity of controlling the conditions, particularly the temperature, by means other than combustion in the furnace-chamber. 3500 w. *Bul Am Inst of Min Engrs*—Feb., 1913. No. 40161 F.

Recent Advances in Scientific Steel Metallurgy. J. O. Arnold. Lecture before the Roy. Inst. Briefly reviews the past history of steel and discusses modern scientific advances in steel metallurgy. 2500 w. *Nature*—March 13, 1913. Serial. 1st part. No. 40801 A.

Methods

Mining Methods on the Missabe Iron Range. Willard Bayliss, E. D. McNeil and J. S. Lutes. Considers the under-

Consult Classification of the Index. See page 9.

Michigan

ground mining, open pit, and milling-pit mining. Ills. 6000 w. L. Superior Min Inst—Aug. 26, 1913. No. 44590 N.

Michigan

Scientific Management on the Menominee Range. George E. Edwards. An account of the development of four properties by the Munro Iron Mining Co. Ills. 2500 w. Min & Engng Wld—Nov. 23, 1912. No. 37780.

History of the Cascade Iron Range of Michigan. P. B. McDonald. Reviews the history of the mines and discusses the geology and the future of the district. 4000 w. Min & Engng Wld—Nov. 16, 1912. No. 37609.

Extensive Operations on the Gogebic Iron Range. George E. Edwards. Illustrates and describes recent developments of interest. 2500 w. Min & Engng Wld—Feb. 8, 1913. No. 39740.

Beneficiation of Lake Iron Ores. Dwight E. Woodbridge. Report concerning projects developed during the past year. Briefly considers concentration, calcining, the Grondal process, desulphurizing, etc. 1100 w. Eng & Min Jour—Feb. 8, 1913. No. 39736.

Progressive Mines in the Iron River District. George E. Edwards. Illustrated account of recent improvements introduced. 1500 w. Min & Engng Wld—March 22, 1913. No. 40770.

Active Iron Mines in Michigan Ranges. George E. Edwards. Brief account of the mines that will be active this season. Ills. 2500 w. Min & Engng Wld—June 7, 1913. No. 42722.

Developments on Michigan Iron Ranges. P. B. McDonald. Reviews the history of iron ore shipments from Michigan ranges, describing the principal features of important districts. Ills. 3500 w. Eng & Min Jour—Aug. 23, 1913. No. 44551.

See also Ore Deposits and Prospecting, under *Iron and Steel*.

Micrography

Micrographical Studies. Memoir on certain micrographical observations of practical interest for valuing and testing and for working metals by different methods. Ills. 1500 w. Am. Found Assn—Dec., 1912. No. 39520 N.

Industrial Application of Microscopic Metallography for Controlling the Work Put on Copper and Brasses. C. Gard. Read before the Int. Assn. for Test. Mat. Describes an investigation and states results. 3500 w. Chem Engr—Dec., 1912. No. 38818 C.

Standard Magnification for Micrographs. M. T. Lothrop and C. R. Bulley. Read before the Int. Assn. for Test. Mat.

IRON AND STEEL

Minnesota

A study showing the unsatisfactory state at present and urging standardization. 1100 w. Chem Engr—Jan., 1912. No. 39499 C.

An Improved Metallurgical Microscope. Wirt Tassin. Illustrates and describes a complete metallographic outfit consisting of a camera, microscope, and illuminating device, all self-contained. 1000 w. Met & Chem Engr—Jan., 1913. No. 38973 C.

Oblique Illumination in Petrographic Microscope Work. Fred Eugene Wright. Considers methods of producing oblique illumination and their suitability for use in practical work. 5000 w. Am Jour of Sci—Jan., 1913. No. 39437 D.

Microscopy

The Microscope in the Iron and Steel Industry. Albert Sauveur. Extracts from a paper read before the Am. Ir. & St. Inst. Explains the practical value of the instrument. Ills. Discussion. 4500 w. Ir Trd Rev—June 5, 1913. No. 42674.

A Method of Repairing Sections of Fractures of Steel for Microscopic Examination. Alfred Campion and John M. Ferguson. Read before the Iron & Steel Inst. Describes a method devised by the authors, giving a few micrographs to show results. 1000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45191 A.

See also Micrography, under MECHANICAL ENGINEERING, *Materials of Construction*.

Mill Design

Design of Structural Steel Plant. E. H. Darling. Considers general conditions controlling the design of a plant of 10,000 tons a year capacity. 4000 w. Can Engr—June 5, 1913. Serial. 1st part. No. 42686.

Mining Industry

Some Suggestive Phases of the Iron Mining Industry of Eastern North America. Frank L. Nason. A review of phases and history since 1608, discussing facts that indicate the return of iron-making to the East. 5000 w. Jour Can Min Inst—Vol. XIV. No. 42027 N.

Minnesota

The Iron Ores of the South Range of the Cuyuna District, Minnesota. Carl Zapffe and W. A. Barrows, Jr. Gives the location of the district and considers the ores. The information is from drill-hole records. 4000 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40156 F.

Rapid Development of the Cuyuna Range. George E. Edwards. An account of the mines and production of present interest. 3000 w. Min & Engng Wld—Aug. 23, 1913. No. 44579.

Consult Classification of the Index. See page 9.

Missouri**Missouri**

Iron Mining in Missouri. Lucius L. Wittich. An account of the revival of work on deposits formerly extensively mined. Ills. 2000 w. Mines & Min—Nov., 1912. No. 37194 C.

Montreal Mine

Montreal Iron Mine, Gogebic Range. Illustrate description of the surface equipment, and the hoist safety devices, underground pump stations and mining methods of the Montreal mine. 2500 w. Eng & Min Jour—May 10, 1913. No. 41961.

Nevada

The Barth Iron Ore Deposits. J. Claude Jones. Detailed description of these deposits in Nevada and the development. 5000 w. Ec-Geol—April-May, 1913. No. 42324 D.

Newfoundland

The Wabana Iron Mines of the Nova Scotia Steel and Coal Company, Limited. Thomas Cantley. Illustrated description of the ore beds, iron mines, methods, submarine development, etc. Plates. 7500 w. Jour Can Min Inst—Vol. XIV. No. 42028 N.

New York

The Ontario Iron Mine, New York. Charles F. Taylor and William M. Booth. Illustrated description of the methods of working hematite ore deposits in Wayne Co., New York. 1200 w. Eng & Min Jour—Nov. 9, 1912. No. 37365.

Nomenclature

Nomenclature of the Microscopic Constituents and Microstructures of Steel and Cast Iron (Nomenclature des constituants microscopiques et des microstructures de l'acier et de la fonte). Report of an international commission presented by H. M. Howe and Albert Sauveur. Diagram. 7000 w. Rev de Metall—Dec., 1912. No. 38484 H.

The Nomenclature of the Microscopic Substances and Structures of Steel and Cast Iron. A committee report to the Int. Assn. for Test. Mat. 9000 w. Chem Engr—Jan., 1913. No. 39498 C.

On Uniform Nomenclature of Iron and Steel. H. M. Howe. Report of the Committee, presented by the Chairman. 8500 w. Am Found Assn—Dec., 1912. No. 39527 N.

Utility of a Metallographic Nomenclature. Felix Robin. Suggestions for substituting rational symbols, grouping as far as possible analogous constitutions. 1000 w. Am Found Assn—Dec., 1912. No. 39513 N.

Old Mines

A Methuselah Among American Mines. L. O. Kellogg. Illustrated account of the

IRON AND STEEL**Open-Hearth Furnaces**

Sterling iron mine in eastern New York, which has been operated continuously for 160 years. 1200 w. Eng & Min Jour—Sept. 6, 1913. No. 44988.

Ontario

Development of the Michipicoten Range, Ontario. George E. Edwards. The future of the district is dependent on the hematite ore, although other ores are found. Illustrated description of development work. 2000 w. Min & Engng Wld—Feb. 15, 1913. No. 39868.

Open-Hearth Furnaces

Open-Hearth Furnace Design and Manipulation. John Ploehm. Describes how the various areas and discussions of a 25-ton furnace were proportioned and give the results obtained. Ills. 4500 w. Foundry—Nov., 1912. No. 37231.

The Siemens Regenerative Gas-Fired "Push" Furnace for Reheating Ingots, Blooms and Billets. Frederick Siemens. Illustrated detailed description. 2200 w. Ir & Coal Trds Rev—Nov. 8, 1912. No. 37653' A.

Open-Hearth Furnace Heads (Ueber Martinofenköpfe). Hubert Hermanns. Discusses different practice in the design of heads, American and German, and describes methods of setting. Ills. Serial. 1st part. 1600 w. Giess-Zeit—Oct. 15, 1912. No. 37416 D.

Silica Bricks in Open-Hearth Furnaces (Ueber Silikasteine für Martinöfen). Otto Lange. Gives qualities of good brick, methods of treatment and application, forms, etc. Ills. 4200 w. Stahl u Eisen—Oct. 17, 1912. No. 37404 D.

The Heat Accumulation of the Open-Hearth Furnace in the Course of its Life (Die Wärmespeicher des Siemens-Martin-Ofens im Verlaufe der Ofenreise. Eduard Juon. Discussion on the efficiency and durability of heat accumulators. Ills. Serial. 1st part. 3500 w. Stahl u Eisen—Oct. 24, 1912. No. 37406 D.

Experiments with Open-Hearth Regenerators. E. Juon. Abstract translation from *Stahl und Eisen*. Gives valuable information secured by the use of pressure and temperature meters. 3500 w. Ir Age—Dec. 26, 1912. No. 38540 C.

Multiple-Hearth Siemens-Martin Furnaces and Circular Furnace Doors (Mehrerhdige Siemens-Martin-Ofen und runde Siemens-Martin-Ofentüren). R. Dietrich. Describes advantages from double-hearth operation, and gives details of circular door. Ills. 1500 w. Stahl u Eisen—Nov. 14, 1912. No. 38405 D.

Use of Cold Coke-Oven Gas in Steel Production. A report of advantages de-

Consult Classification of the Index. See page 9.

Open-Hearth Furnaces

IRON AND STEEL

Ore Deposits

veloped in recent open-hearth practice in Germany. 2000 w. *Ir Age*—April 24, 1913. No. 41586 C.

The Nature and Sequence of Reactions in the Acid Open-Hearth Process. F. A. Matthewman and A. Campion. A general review of the subject, based upon results and figures obtained during a number of years of practical working of open-hearth furnaces. Discussion. 1300 w. *Jour W of Scotland Ir & St Inst*—Dec., 1912, Jan.-Feb., 1913. No. 41702 N.

Open-Hearth Furnaces, Maerz Construction (Ueber Siemens-Martin-Oefen, Bauart Maerz). Rud. Becker. Details of improvements effected by the Maerz design. Ills. 3500 w. *Stahl u Eisen*—March 20, 1913. No. 41405 D.

Operation of the Friedrich Open-Hearth Furnace (Betriebsverfahren mit dem Siemens-Martin-Ofen, Bauart Friedrich). O. Friedrich. Details of the Friedrich construction, as shown at Julienhütte. Ills. 2100 w. *Stahl u Eisen*—March 13, 1913. No. 41403 D.

The Heat Balance of the Open Hearth. Sidney Cornell. An account of an elaborate heat-efficiency test made on two 60-ton open-hearth furnaces. 7000 w. *Met & Chem Engng*—May, 1913. No. 41902 C.

The Manufacture of Open-Hearth Steel. Kenneth Seaver. Illustrated description of the modern open-hearth furnace and its operation. 2500 w. *Ir Trd Rev*—May 15, 1913. Serial. 1st part. No. 42065.

On Modern Open-Hearth Steel Furnaces. Benjamin Talbot. Deals especially with the development of the tilting form of open hearth furnace. Ills. 3000 w. *Iron & Steel Inst*, No. 16—Sept., 1913. No. 45095 N.

Tilting Furnaces Installed by Lackawanna Steel. Describes the two tilting open-hearth furnaces for refining steel by the duplex process. Ills. 1500 w. *Ir Trd Rev*—Sept. 11, 1913. No. 45049.

Improvements in the Bernhardt Open-Hearth Furnace. F. Bernhardt, in *Stahl und Eisen*. Illustrates and describes improvements introduced in the most recent form of this furnace. 1500 w. *Ir & Coal Trds Rev*—Aug. 22, 1913. No. 44933 A.

Some Observations on Miniature or Detachable Open-Hearth Furnaces. W. M. Carr. Explains the salient features resulting from a new application of steel-melting furnaces. Ills. 5500 w. *Am Found Assn*—Oct, 1913. No. 46256 N.

Use of Waste Heat on Open Hearth Furnaces. Shows that losses are reduced about 40 per cent, by conducting the gases to a boiler plant, and illustrates and describes details of construction.

2000 w. *Ir Age*—Feb. 20, 1913. No. 39925 C.

Utilization of Waste Heat from Siemens-Martin Furnaces (Ueber die Abhitzeverwertung bei Siemens-Martin-Oefen). J. Schreiber. Plans and descriptions of plants utilizing waste heat, and results attained thereby. Ills. Serial, 1st part. 5600 w. *Stahl u Eisen*—Jan. 9, 1913. No. 40003 D.

The Blair Indestructible Port and Bulkhead Open-Hearth Furnaces. Illustrated description of the arrangement as applied to some open-hearth furnaces in the Glasgow district, explaining the advantages resulting. 2500 w. *Ir & Coal Trds Rev*—Feb. 21, 1913. No. 40322 A.

New Design of Open Hearth Steel-Furnace Using Producer Gas. Herbert F. Miller, Jr. Describes a design, explaining its advantages. Ills. 1000 w. *Bul Am Inst of Min Engrs*—March, 1913. No. 40895 F.

Development in Open-Hearth Furnaces, Bernhardt Construction (Fortschritte des Siemens-Martin-Ofens, Bauart Bernhardt). Fr. Bernhardt. Plans and description of a 50-ton furnace for molten charges devised by the author. 2000 w. *Stahl u Eisen*—Feb. 20, 1913. No. 40507 D.

New Design of Regenerators of Open-Hearth Furnaces. H. F. Miller, Jr. Calls attention to defects of the present type of regenerator chambers, the qualities to overcome these defects, and gives results of a new design. Ills. 1000 w. *Bul Am Inst of Min Engrs*—June, 1913. No. 43258 F.

Ore Deposits

The Iron Ore Deposits of the Cebolla District, Gunnison County, Colorado. Joseph T. Singewald, Jr. Describes the general geology and discusses the ore deposits. Ills. 3500 w. *Ec-Geol*—Sept., 1912. No. 37672 D.

The World's Greatest Iron Ore Deposits. Day Allen Willey. A contrast of methods and machinery used in Cuba and Lake Superior. Ills. 5500 w. *Engineering Magazine*—March, 1913. No. 40083 B.

Cuban Iron-Ore Reserves. De Berniere Whitaker. Gives a summary of three billion tons almost wholly free from trust control. 800 w. *Engineering Magazine*—Nov, 1913. No. 46309 B.

The Iron Resources of the Chattanooga District. John Jermain Porter. Information showing that sufficient ore exists in this district to supply several steel plants. 1700 w. *Mfrs' Rec*—Oct. 9, 1913. No. 45754.

The Titaniferous Iron Ores in the United States, Their Composition and Economic Value. Joseph T. Singewald.

Consult Classification of the Index. See page 9.

Ore Resources

Jr. A report of investigations aiming to find a method of utilizing these ores. Ills. 141 pp. U S Bureau of Mines—Bul 64. No. 46111 N.

Ore Resources

The Iron Ore Resources of the World. Frank D. Adams. A summary of the results of an investigation. 4000 w. Jour Can Min Inst—Vol. XIV. No. 42025 N. See also Canada, under *Iron and Steel*.

Ore Sorting

Iron Ore Sorting Plant at the Gellivare Mines, Sweden. Harry J. H. Nathorst. Illustrated description of plants erected for sorting the newly-mined iron ore. 2000 w. Ir & Coal Trds Rev—March 21, 1913. No. 41022 A.

Pig Iron

The Foundry and the Pig Iron Market. A. I. Findley. Discusses the supply and price of pig iron and the probability of certain changes affecting them. 2500 w. Am Found Assn—Dec., 1912. No. 38616 N. Pig Iron and Its Method of Manufacture. John Jermain Porter. One of a series of articles under title of "The A B C of Iron and Steel." Ills. 6000 w. Ir Trd Rev—Jan. 2, 1913. (Special.) No. 38743 D.

The Estimation of Pig Iron. J. Kail. Explains why the method of estimating from the appearance of a fracture should be discarded and chemical analysis exacted in its place. 1000 w. Am Found Assn—Dec., 1912. No. 39511 N.

The Methods of the United States Steel Corporation for the Commercial Sampling and Analysis of Pig-Iron. A compilation of standard methods for the sampling and subsequent analysis of molten pig-iron. 10800 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40162 F.

Specifications for Foundry Pig Irons. W. B. Parker. Abstract of paper before The British Found. Assn. Deals with pig irons used in iron foundries, limited to the requirements of the British Isles. 5000 w. Ir & Coal Trds Rev—March 28, 1913. No. 41148 A.

Piping

The Ferrum System of Wrought Piping. Illustrates and describes forms of pipe joints for high pressure work. 1800 w. Ir Age—Oct. 16, 1913. No. 45912 C.

Production

The Rank of the Iron Industry in Industrial Life (Die Stellung der Eisenindustrie im Wirtschaftsleben). W. Johannes. Reviews statistics of persons employed in the iron trade, showing its industrial importance. 3000 w. Stahl u Eisen—Nov. 28, 1912. No. 38409 D.

IRON AND STEEL

Pyrites

What Our Neighbors Can Do in Mining Iron Ore. Dwight E. Woodbridge. Calls attention to important work in progress in Alabama, New York, and other states. 1800 w. L Superior Min Inst—Aug. 26, 1913. No. 44589 N.

Course of Iron Output and Prices in Century. E. C. Eckel. Statistical research covering the period, 1800-1910, with conclusions relating to the future of the industry. 2000 w. Ir Trd Rev—Aug. 21, 1913. No. 44526.

Puddling

The Reactions of the Puddling Process. Thomas Turner. Discusses the possibility of improving the puddling process and urges recognition of the place held by wrought or malleable iron. 6500 w. Jour W of Scotland Ir & St Inst—Dec., 1912, Jan.-Feb., 1913. No. 41701 N.

Roe Puddling Process Developments. David E. Roberts. Read before the Staffordshire Inst. (Abstract.) Illustrates and describes the puddling plant of the Reading Iron Co., U. S. A. Discussion. 2500 w. Ir & Coal Trds Rev—April 18, 1913. No. 41780 A.

Pure Iron

The Critical Ranges of Pure Iron, with Special Reference to the A₁ Inversion. H. C. H. Carpenter. Experimental results and reasoning with statement of conclusions. 3300 w. Ir & St Inst—May, 1913. No. 42236 N.

The Critical Ranges A₂ and A₃ of Pure Iron. G. K. Burgess and J. J. Crowe. Gives a critical historical summary of the experimental investigations of the location of A₂ and A₃ in pure iron, with brief mention of the theoretical aspects, and an account of a series of experiments with samples of very pure iron. Ills. 13500 w. Bul Am Inst of Min Engrs—Oct, 1913. No. 46355 F.

Pyrites

Pyrites in Canada: Its Occurrences, Exploitation, Dressing and Uses. Alfred W. G. Wilson. Information and description of properties with outline of methods employed for utilizing the sulphur contents of these ores. Map & Ills. 200 pp. Can Dept of Mines—No. 167. No. 40817 N.

The Occurrence of Pyrites in Canada. Alfred W. G. Wilson. Reviews the occurrence in the different provinces. Map. 3000 w. Can Min Jour—April 1, 1913. Serial. 1st part. No. 41097.

Some Notes on Pyrite and Marcasite. E. B. Wilson. Brief Study with statement of deductions. 1800 w. Jour Can Min Inst—Vol. XIV. No. 42029 N.

The Vadose Synthesis of Pyrite. Alfred R. Whitman. Describes experiments undertaken to determine whether it

Consult Classification of the Index. See page 9.

Refining

would be possible to reproduce in a laboratory the essential conditions of vadose circulation, and obtain the oxidation, solution, transportation, reduction, and re-deposition of pyrite. 5000 w. *Ec-Geol*—Aug., 1913. No. 44382 D.

Refining

The Electric Refining of Steel in an Induction Furnace of Special Type. Otto Frick. Read before the Iron & Steel Inst. Discusses the future development of the electric furnace, especially considering the Frick furnace at Krupp's works. Ills. 7500 w. *Ir & Coal Trds Rev*—Sept. 5, 1913. No. 45195 A.

Reviews of 1912

The Metallurgy of Iron and Steel. Bradley Stoughton. Reviews the developments during 1912, novelties in practice introduced, etc. 4500 w. *Eng & Min Jour*—Jan. 11, 1913. No. 38987.

Progress in the Metallurgy of Iron and Steel. Bradley Stoughton. A résumé of the developments of 1912 in works, practice, and in the experiments of well-known laboratory investigators. 4000 w. *Ir Age*—Jan. 2, 1913. No. 38751 C.

I. The Iron and Steel Industries in the United States. A general review of the past year. II. Review of the Lake Superior Iron-Mining Industry. Dwight E. Woodbridge. Reviews the remarkable industrial expansion and the year's developments. 5500 w. *Min & Engng Wld*—Jan. 25, 1913. No. 39418.

Iron Ore, Pig Iron, and Steel During the Year. G. H. Cushing. A review of trade conditions, prices, and the influences affecting the Eastern ore trade. 1800 w. *Min & Sci Pr*—Jan. 4, 1913. (Special.) No. 38932 C.

European Ore Disappears from Eastern Market. C. J. Stark. Reviews conditions during 1912, showing the elimination of foreign ore and the development of domestic and Cuban properties. Ills. 4500 w. *Ir Trd Rev*—Jan. 9, 1913. No. 38919.

Iron and Steel in 1912. The production, markets and districts are reviewed by different writers. 7000 w. *Eng & Min Jour*—Jan. 11, 1913. No. 38985.

The Iron and Steel Trades in 1912. General and district reviews. 14000 w. *Ir & Coal Trds Rev*—Jan. 3, 1913. No. 39173 A.

The Iron Trade in 1912. Reports for Pittsburgh, Philadelphia, Chicago, and Cincinnati. 9800 w. *Ir Age*—Jan. 2, 1913. No. 38760 C.

Lake Superior Iron Ore Trade in 1912. Dwight E. Woodbridge. Shows the increasing dependence on the leaner ores, developments in new mines and additional

IRON AND STEEL

Rolling Mills

reserves to old properties, etc. 3000 w. *Ir Age*—Jan. 2, 1913. No. 38762 C.

Rolling Mills

The Jones and Laughlin Continuous Rolls, Pittsburg, Pa. (Kontinuierliche Stabstrasse beim Jones and Laughlin, Pittsburg, Pa.). Fr. Trappiel. Description of roll arrangement, etc. Ills. 1500 w. *Stahl u Eisen*—Oct. 10, 1912. No. 37403 D.

Studies on North American Rolling Mills (Studien über nordamerikanische Walzwerke). J. Puppe. Reviews some of the interesting features encountered in ten of the leading steel works of the U. S. Ills. Serial. 1st part. 5600 w. *Stahl u Eisen*—Nov. 21, 1912. No. 38407 D.

Electrically Driven Plate-Armor Rolling Mill in Witkowitz (Elektrisch betriebenes Panzerplattenwalzwerk in Witkowitz). J. Sutmann. Illustrated description of plant. 3100 w. *Stahl u Eisen*—Nov. 14, 1912. No. 38404 D.

Power Requirements of Rolling Mills. Wilfred Sykes. Considers the factors controlling the size and equipment required. 4000 w. *Pro Am Inst of Elec Engrs*—Nov., 1912. No. 37897 F.

Discussion on "Power Requirements of Rolling Mills." Wilfred Sykes, and "The Economical Speed Control of Alternating-Current Motors Driving Rolling Mills." F. W. Meyer and Wilfred Sykes, New York, Nov. 8, 1912. 7000 w. *Pro Am Inst of Elec Engrs*—Jan., 1913. No. 39362 F.

Discussion on "Power Requirements of Rolling Mills." Wilfred Sykes. And "The Economical Speed Control of Alternating-Current Motors Driving Rolling Mills." F. W. Meyer and Wilfred Sykes. New York, Nov. 8, 1912. Continued discussion. 3500 w. *Pro Am Inst of Elec Engrs*—March, 1913. No. 40446 F.

Electrical Plant for Driving the Reversing Rolling-Mill at the Skinningrove Ironworks. Illustrated detailed description. 5500 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38855 D.

Some Considerations in Connection with Electrically Driven Non-reversing Mills. S. H. Eckmann. A comparison of steam driven mills with electrically driven mills, outlining methods. 4500 w. *Elect'n, Lond*—Dec. 13, 1912. (Special.) No. 38846 D.

Reversing Mill Trains (Ueber Umkehrstrassenantriebe). Georg Meyer. Practical considerations in the operation of steam, electric, hydraulic or gas driven reversing rolls. Ills. 4200 w. *Stahl u Eisen*—Jan. 2, 1913. No. 40001 D.

On a New Form of Electrically Driven Two-High Continuous-Running Revers-

Rolling Mills

ing Mill. Andrew Lamberton. A short description of the method. Ills. 2200 w. Ir & St Inst—May, 1913. No. 42242 N.

Rolling Mill Practice in the United States. J. Puppe. Read at May meeting of Ir. & St. Inst. A discussion of the types of finishing mills. 3500 w. Ir Trd Rev—May 1, 1913. Serial. 1st part. No. 41796.

Rolling-Mill Practice in the United States. Part II. J. Puppe. A review of American practice and the characteristics of construction and arrangement. Ills. 8500 w. Ir & St Inst—May, 1913. No. 42244 N.

Electrically-Operated, Canadian Rolling Mill. Illustrated description of a new plant recently placed in operation at Hamilton, Ont., combining all the latest improvements. 3000 w. Ir Trd Rev—July 3, 1913. No. 43453.

The Key to Industrial Development. James Steelman. Reviews the progress of the rolling mill. Ills. 3500 w. Casier's—July, 1913. No. 43355.

The Rolling Mill Industry. F. H. Kindl. A condensed general description of rolling mills and their products. 2500 w. Ir Trd Rev—Aug. 7, 1913. Serial, 1st part. No. 44225.

Electric Drive for Reversing Rolling Mills. James A. Seager. Diagram and description of an English installation for operating a 30-inch cogging mill and a 24-inch bar mill. 1500 w. Ir Trd Rev—Aug. 21, 1913. No. 44525.

New Electrically-Driven Rolling-Mill Plant of the Steel Company of Canada, Limited. Plan and illustrated description of the special features of the plant. 2500 w. Ir & Coal Trds Rev—July 25, 1913. No. 44192 A.

Rolling-Mill Engines (Ueber Walzenzugmaschinen). C. Kiesselbach. A brief statement of the power requirements for various duties. 1900 w. Stahl u Eisen—July 17, 1913. No. 44606 D.

The Electric Drive for Rolling Mills. Brent Wiley. From a paper read before the Assn. of Iron and Steel Elec. Engrs. Gives a comparison with works using steam engines, with list of gas power plants. 3000 w. Ir Age—Oct. 16, 1913. No. 45914 C.

See also Belts, under MECHANICAL ENGINEERING, *Power and Transmission*.

Sampling

Sampling Iron Ore at Lake Superior Mines. Benedict Crowell. Read before the L. Superior Min. Inst. A discussion of the inadequate methods generally pursued, with suggestions for improvements. 2500 w. Ir Trd Rev—Dec. 26, 1912. No. 38538.

IRON AND STEEL

Silesia

A Statistical Statement of the Iron Industry of Upper Silesia for 50 Years (50 Jahre oberschlesischer Eisenindustrie in statistischer Darstellung). Ernst Jüngst. Charts and tables showing increased production along all lines during the period. 35 pp., Glückauf—Aug. 30, 1913. No. 45399 D.

Slag

The Function of Slag in Electric Steel-Refining. Richard Amberg. Discusses the points in which the chemical action of the slag of the electric differs from the corresponding slags of other processes. 4500 w. Bul Am Inst of Min Engrs—Feb., 1913. No. 40160 F.

Smelting

Foundry Pig Iron Smelted in Electric Furnaces. Illustrated description of the operations of the Noble Electric Steel Co., at Heroult, Cal. 3000 w. Ir Trd Rev—Sept. 18, 1913. No. 45201.

Iron Smelting in Maryland in the 18th Century. Henry Williams Lewis. An account of the first iron works built in the state and the difficulties encountered. Ills. 1500 w. Ir Trd Rev—Sept. 11, 1913. No. 45048.

Spain

Iron Deposits and Industry at Bilbao (Die Eisenerzlager und die Eisenindustrie von Bilbao). E. Dann. A general description of the geology and mining methods in this old Spanish district. Ills. Serial, 1st part. 2300 w. Stahl u Eisen—July 17, 1913. No. 44605 D.

Steel Mills

Design of Steel Mill Buildings. R. Fleming. A review and discussion of the considerations governing their general features, proportioning and detailing. 5500 w. Eng Rec—Oct. 25, 1913. Serial, 1st part. No. 46210.

How a German Iron and Steel Plant Is Equipped. Anton Schwartz. Illustrated description of the Rheinische Stahlwerke, which include blast furnaces, Bessemer converters, rolling mills and a by-product coke plant. 1700 w. Ir Trd Rev—Oct. 16, 1913. No. 45910.

Working Conditions and Efficiency in American Steel Works as Affected by the Speed and Severity of the Work. From a report on "Conditions of Employment in the Iron and Steel Industry in the United States," presented to the U. S. Senate. 4500 w. Ir & Coal Trds Rev—Oct. 10, 1913. Serial, 1st part. No. 45991 A.

Steel Plants

The Steel Trust (Le trust de l'acier). Eugène L. Dupuy. An account of the holdings, operation and organization of

Steel Properties

the United States Steel Corporation. 4000 w. Rev de Metal—April, 1913. No. 41516 H.

Design of Structural Steel Plant. E. H. Darling. Discusses the general conditions controlling the design of a plant of 10000 tons a year capacity. 7500 w. Ap Sci—June, 1913. No. 43766 C.

Steel Properties

The Influence of Mechanical Working on the Properties of Iron and Steel (Ueber den Einfluss der mechanischen Formgebung auf die Eigenschaften von Eisen und Stahl). P. Goerens. Results from rolling, etc., on elasticity, hardness, specific weight, magnetic and electric properties, structure, etc. Ills. 4200 w. Stahl u Eisen—March 13, 1913. No. 41404 D.

Material Changes Due to Cold Rolling (Ueber Materialveränderung durch Kaltwalzen). H. Hanemann and Ch. Lind. A micrographical study of structural changes in sheet steel. Ills. 2400 w. Stahl u Eisen—April 3, 1913. No. 41411 D.

Steels

Cementation of Steel by the Use of Gases. Reviews an article by Franz Kurek in *Stahl und Eisen*, giving results of experiments with carbon monoxide, methane with ammonia gas and illuminating gas. Ills. 1500 w. Ir Age—Dec. 19, 1912. No. 38275 C.

The Action of Various Commercial Carbonizing-Materials. Robert R. Abbott. Reports an investigation undertaken to compare most of the important commercial carbonizers as to cost of carbonizing, rapidity, and the nature of the carbon-zones. 8000 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38369 F.

The Cause of Piping and Its Relation to Contraction and Charge (Die Ursachen der Lunkerung und ihr Zusammenhänge mit Schwindung und Gattierung). A. Diefenthaler. Experiments and studies. Ills. 3500 w. Stahl u Eisen—Oct. 31, 1912. No. 38400 D.

Heat Treatment of Steels. M. Kowolik. Trans. from the German. Discusses the influence of thermal treatment upon the physical properties of steels. 2500 w. Prac Engr—Dec. 19, 1912. No. 38871 A.

The Next Improvement in Steel Making. George Auchy. Advocates "killing" in molds, discusses the exaggerated emphasis put upon chemical purity. 1500 w. Ir Age—Jan. 23, 1913. No. 39321 C.

The Effect of Arsenic on the Properties of Mild Steel (Ueber den Einfluss des Arsens auf die Eigenschaften des Flusseisens). J. Liedgens. Studies on the characteristics exhibited by varying the

IRON AND STEEL

arsenic content. Ills. and diagram. 3100 w. Stahl u Eisen—Dec. 19, 1912. No. 39001 D.

Why Does Lag Increase with the Temperature from Which Cooling Starts? Henry M. Howe. An inquiry into the effects of high heating of steel. 2500 w. Bul Am Inst of Min Engrs—March, 1913. No. 40902 F.

The Value of Temperature Measurement in the Manufacture of Steel, Especially High Grade Steel (Wert der Temperaturmessung bei der Bearbeitung des Stahles unter besonderer Berücksichtigung der Qualitätsstahle). Johannes Rautenkranz. Necessity and methods of measurement and types of thermometers. Ills. Serial, 1st part. 3000 w. Zeit f Werkzeug—Feb. 15, 1913. No. 40574 D.

Ae 1, the Equilibrium Temperature for A 1 in Carbon Steel. Henry M. Howe. A study contributed from the metallurgical laboratories of Columbia University. 3500 w. Bul Am Inst of Min Engrs—June, 1913. No. 43260 F.

Research on the Hardness of Steel. Captain C. Grard. Read before the Int. Assn. for Test Met. Gives a series of tests on carbon steels, and tests of variation of the mechanical properties with the tempering temperature. 4000 w. Chem Engr—June, 1913. No. 43163 C.

Differences between the Structure and Composition of Certain Steels (Divergences entre la structure et la composition de certains aciers). M. Brès. A metallographic study of steels made under similar conditions. Ills. 4000 w. Rev de Metal—July, 1913. No. 43557 E + F.

A New Method for the Determination of the Critical Points Ar 1 and Ac1. J. E. Stead. Read before the Iron & Steel Inst. Describes this new method. 2500 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45184 A.

Over-Oxidation of Steel. W. R. Shimer and F. O. Kichline. Describes an investigation for the purpose of studying the extent of over-oxidation of steel that can be accomplished by excessive over-blowing in a Bessemer converter. Ills. 4000 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45471 F.

The Effect of Heat Treatment on the Colorimetric Test for Carbon in a 0.32 Carbon Steel. Edward D. Campbell and Frank D. Haskins. Abstract of a paper read before the Iron & Steel Inst. Describes experiments undertaken in the hope of gaining information on the probable constitution of the carbides of iron. 3000 w. Ir & Coal Trds Rev—Sept. 5, 1913. No. 45194 A.

Steels

Steels

On the Relative Properties of Acid and Basic Steel. A. Campion and J. K. Longbottom. Reports an investigation of the behavior, under various conditions, of steels produced by different processes. Also discussion. Ills. 12000 w. Jour W of Scotland Ir & St Inst—March-April, 1913. No. 45530 N.

Granular Pearlite and Its Importance for the Heat Treatment of Steel (Ueber körnigen Perlit und seine Bedeutung für die Wärmebehandlung des Stahls). H. Hanemann and Fr. Morawe. Discussion on the appearance and mechanical properties peculiar to this steel. Plates. 4400 w. Stahl u Eisen—Aug. 14, 1913 No. 45377 D.

The Influence of Copper Upon the Physical Properties of Steel. A. Howell Clevenger, and Bhupendranath Ray. Report of investigation made to assist in removing prejudices in regard to copper steel. Ills. 7000 w. Bul Am Inst of Min Engrs—Oct, 1913. No. 46350 F.

The Influence of Various Elements on the Absorption of Carbon by Steel. Robert R. Abbott. Gives results of experiments undertaken to obtain more exact data upon this subject. 2500 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46347 F.

See also Ingots, Steel, and Tool Steel, under MECHANICAL ENGINEERING, *Materials of Construction*.

Steel Sheets

Essentials in the Making of the Finer Steel Sheets. John G. Homan. Considers essentials in the manufacture of highly finished steels. 2000 w. Met & Chem Engng—May, 1913. No. 41901 C.

Steel Specifications

Revision of the Specifications for Steel. Reviews the important work of committee A-1 of the Am. Soc. for Testing Materials. Also late investigations in steel and non-ferrous metals, and gives three proposed specifications for iron and steel. 10000 w. Ir Age—July 3, 1913. No. 43452 C.

Steel Tests

Shock Tests of Cast Steel. John H. Hall. The Fremont testing machine; its operation, sensitiveness, and value in heat treatment. Ills. 1200 w. Bul Am Inst Min Engrs—July, 1913. No. 44015 F.

The Resistance of Steel to Wear. George L. Morris. Read before the Am. Soc. for Test. Mat. Describes tests made with the object of studying the relations between the wear resistance of various steels and the physical properties of elastic limit, tensile strength, and hardness. 1200 w. Ir Trd Rev—July 10, 1913. No. 43600.

IRON AND STEEL

Steel Works

Power Machinery of the American Steel Industry. Robert L. Streeter. Fifth article of a series. This paper discusses steel-plant electrical installations. Ills. 5500 w. Engineering Magazine—Dec., 1912. No. 37793 B.

Power Machinery of the American Steel Industry. Robert L. Streeter. Sixth and last article of a series. This paper discusses the development and present types of steel-plant coke ovens. Ills. 6800 w. Engineering Magazine—Jan., 1913. No. 38680 B.

The Jones & Laughlin Aliquippa Works. General plan and illustrated description of the blast furnaces, steel works and rolling mills, duplexing with the Talbot process, etc. 3500 w. Ir Age—Jan. 2, 1913. No. 38753 C.

The Skoda Steel Works, Pilsen, Bohemia. Illustrated detailed description of the works and some of the products. 4000 w. Engr., Lond—Jan. 17, 1913. No. 39486 A.

A New Electrically Driven Sheet Mill. Illustrated description of the plant of the Apollo Steel Co., Apollo, Pa. Electric Power. 2500 w. Ir Age—June 26, 1913. No. 43238 C.

The Adolf-Emil Iron and Steel Works, Esch. From *Stahl und Eisen*. Illustrated description of the works, their equipment, and operation. 4000 w. Ir & Coal Trds Rev—May 30, 1913. No. 42791 A.

The Minnesota Steel Company's Plant. Illustrated description of works near Duluth, discussing the special engineering and economic problems. 1500 w. Ir Age—Sept. 18, 1913. No. 45202 C.

A Passing View of Steel Operations at the Soo. R. D. Williams. Descriptive sketch of an iron and steel plant at Sault Ste. Marie, Ont. Ills. 1800 w. Ir Trd Rev—Sept. 4, 1913. No. 44951.

Sulphides

Sulphur and Iron Deposits of Virginia. J. F. Springer. Illustrated account of the mining of pyrites and pyrrhotite and the reclaiming of iron. 1800 w. Min & Engng Wld—March 15, 1913. No. 40667.

Tinplate

The Tinplate Trade: Recent Developments. H. Spence Thomas. From a paper read before the S. Wales Inst. of Engrs. Briefly outlines improvements introduced in the manufacture of tinplate. Discussion. Ills. 6500 w. Ir & Coal Trds Rev—March 28, 1913. No. 41149 A.

The Manufacture of Tin Plates. Ed. W. Patton. Urging the importance of quality and explaining details of manufacture that affect the value of roofing plates. Ills. 1500 w. Jour Ohio Soc of

Consult Classification of the Index. See page 9.

Tool Steels

Mech, Elec, & Steam Engrs — Vol. V.
No. 1. No. 41722 N.

Tool Steels

Microscopic Study of High Speed Tool Steels. Reviews a paper by F. Fettweis, in *Stahl und Eisen*, reporting important microscopic investigations and conclusions. Ills. 1500 w. Ir Age—Jan. 16, 1913. No. 39126 C.

Valuation

Valuation of Iron-Mines. Continued discussion of the paper of James R. Finlay. 1400 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46357 F.

Venezuela

Status of Venezuelan Iron Ore Development. Discusses the possibilities of the deposits of this country as a future source of supply for eastern iron plants. Ills. 1000 w. Ir Trd Rev—March 20, 1913. No. 40721.

Vermilion Range

Development of the Vermilion Iron Range. George E. Edwards. A brief account of the production, mining methods and deposits. Ills. 1500 w. Min & Engng Wld—Oct., 1913. No. 45675.

Washing

The Coleraine Iron Ore Washing Plant. John Uno Sebenius. From a paper read before the L. Superior Min. Inst. Illustrated description of the Trout Lake ore

LEAD AND ZINC**Electric Power**

washing and concentrating mill of the Oliver Iron Mining Co. 3500 w. Ir Age—Aug. 28, 1913. No. 44772 C.

Wire Drawing

Studies in the Cold Flow of Steel. Percy Longmuir. Deals with research work in wire drawing. Ills. 4500 w. Ir & St Inst—May, 1913. No. 42243 N.

Wire Mills

Continuous Wire Rolling-Mill Plant at Eschweiler. From *Stahl und Eisen*. Illustrated detailed description. 1800 w. Ir & Coal Trds Rev—Nov. 29, 1912. No. 38136 A.

New Plant for the Manufacture of Wire Rope. Grund plan and description of works at Kenosha, Wis. 1500 w. Ir Trd Rev—Jan. 23, 1913. No. 39318.

The Wire Mills of the American Steel & Wire Co., in Rankin, Pa. (Die Drahtstrasse der American Steel & Wire Co. in Rankin). Fr. Trappiel. Plans and description. 1400 w. Stahl u Eisen—Jan. 9, 1913. No. 40004 D.

See also Wire, under **MECHANICAL ENGINEERING, Machine Works and Foundries.**

Wrought Iron

The Manufacture of Wrought Iron. James P. Roe. Illustrated review of the historical development of wrought iron. 5000 w. Ir Trd Rev—Feb. 6, 1913. No. 39669.

LEAD AND ZINC**Blast Furnaces**

Development of the American Water-Jacket Lead Blast-Furnace. R. C. Canby. Briefly reviews the development in decades since 1870. 2000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40892 F.

Coeur d'Alene

Origin of Lead, Zinc and Silver in the Coeur d'Alene. Oscar H. Hershey. Discusses the origin of these commercial ores of Idaho. A geological study. 4500 w. Min & Sci Pr—Sept. 27, 1913. Serial, 1st part. No. 45628.

Colorado

The Rico Mining District, Colorado. Etienne A. Ritter. Reviews the history of the district and the recent successful mining of the large low-grade bodies of zinc-lead and of copper. Ills. 2500 w. Min & Engng Wld—May 10, 1913. No. 41973.

Concentration

Canvas Plant of the Federal Lead Company. Claude T. Rice. Drawings and description of an installation of canvas tables for concentrating the tailing from

other concentrating machines. 1000 w. Eng & Min Jour—Sept. 13, 1913. No. 45120.

Electric Furnaces

Causes of the Practical Non-Success of Electric Furnaces in Treating Zinc Ores. Francis Louvrier. Reports an investigation of the causes which explain the incomplete transformation, and the improvements necessary. 2500 w. Met & Chem Engng—Nov., 1912. No. 37255 C.

An Experimental Electric Furnace Plant. Illustrated description of the experimental plant of the Continuous Zinc Furnace Co., Hartford, Conn. 1700 w. Brass Wld—Oct., 1913. No. 45997.

The Electric Zinc Furnace. Peter E. Peterson. Discusses the different types of furnaces employed. Ills. 6500 w. Chem Engr—Sept., 1913. No. 45592 C.

Electric Power

Electric Power in Wisconsin—Illinois Fields. Warren Aikens. Explains the savings and advantages resulting from the introduction of electric power in this zinc district. Ills. 1500 w. Min &

Electro-Metallurgy

Engng Wld—March 15, 1913. Serial, 1st part. No. 40666.

Motor Drive at Zinc Mines and Mills. Warren Aikens. Illustrates and describes features in the handling of the ore from the mines and through the various stages of concentration. 2200 w. Min & Engng Wld—Oct. 25, 1913. No. 46216.

Electro-Metallurgy

Present Status of the Electro-Metallurgy of Zinc (Etat actuel de l'electrometallurgie du zinc). C. Lordier. Comparison of present state of development by this method and results from ordinary methods. Ills. 5400 w. Tech Mod—March 1, 1913. No. 40603 D.

Electrometallurgy of Zinc. Considers the advantages of treating zinc ores in the electric furnace. Ills. 2000 w. Elec Rev, Lond—Sept. 12, 1913. No. 45284 A.

Germany

New Lead and Zinc Concentrator, Tailings Chute, and Charging Plant at the Bleischarley Mine, Beuthen, O.-S. (Die neue Blende- und Bleierzauflbereitung, Haldensturz- und Wiederverladeanlage der Bleischarleygrube bei Beuthen, O.-S.). G. Franke. Illustrated description of plant layout. Plates. Serial. 1st part. 2500 w. Glückauf—Nov. 16, 1912. No. 38418 D.

Graphite

The Santa Maria Graphite Mines, Mexico. W. D. Hornaday. Illustrated description of the largest producing graphite deposits on the western continent. 2500 w. Min & Engng Wld—Dec. 7, 1912. No. 38091.

Joplin

The Joplin Mining District. W. W. Boyd. A general statement of the conditions and methods in the district. 4000 w. Jour Can Min Inst—Vol. XV. No. 42062 N.

Conditions in the Joplin District. Temple Chapman. Résumé of conditions in this Missouri district, describing the nature of the ore deposits and methods of exploration. 1200 w. Eng & Min Jour—Aug. 30, 1913. No. 44887.

Mining and Treatment of Lead and Zinc Ores in the Joplin District, Missouri. Clarence A. Wright. A preliminary report, outlining the general conditions affecting the safety and efficiency of the methods used, and indicating possible improvements. 43 pp. U S Bureau of Mines—Tech paper 41. No. 46108 N.

Lead Mill

Description of a Modern Lead Concentrating Mill, Broken Hill Junction North Mine, N. S. W. Stanley C. Bullock. Detailed description of the equipment and the efficiency. Ills. 6000 w. Inst of Min

LEAD AND ZINC

& Met, Bul 100—Jan. 9, 1913. No. 39550 N.

Lead Poisoning

See Industrial Diseases, under INDUSTRIAL ECONOMY.

Lead Refining

Lead Refining Plant at Omaha, Neb. H. B. Pulsifer. Illustrated description of the world's largest lead refinery. 2000 w. Min & Engng Wld—Sept. 13, 1913. No. 45127.

Lead Smelting

Lead Plant of the International Smelter. L. S. Austin. Illustrated description of the plant and its operation. 3000 w. Min & Sci Pr—Jan. 18, 1913. No. 39316.

Lead-Smelting Plant at Collinsville, Illinois. H. B. Pulsifer. Illustrated detailed description. 3500 w. Min & Engng Wld—Oct. 18, 1913. No. 45947.

New Mexico

The Magdalena Mining District, N. Mex. Edgar G. Tuttle. Describes the development of this zinc-lead-silver district. Ills. 2000 w. Mines & Min—Dec., 1912. No. 38009 C.

Reduction

Reduction of Lead-Copper Matte. Wilhelm Menzel. Summary from Pro. of the Inst. of Smelting & Electrometallurgy at the Tech. Acad. of Aix-la-Chapelle. Gives conclusions of experimental investigations aiming to separate the copper from the lead and eliminate the latter as a metal. 1200 w. Min Jour—Feb. 22, 1913. No. 40307 A.

Refining

Lead Refining Plant at South Chicago. H. B. Pulsifer. Illustrated description of the plant with details of the process used. 3000 w. Min & Engng Wld—July 26, 1913. Serial, 1st part. No. 43941.

Reviews of 1912

The Lead and Zinc Industries in the United States. A summary of events in the leading lead-zinc producing states. 3000 w. Min & Engng Wld—Jan. 24, 1913. No. 39417.

The Metallurgy of Lead in 1912. H. O. Hofman. Reviews advance made, the work and methods. 1000 w. Eng & Min Jour—Jan. 11, 1913. No. 38986.

The Production of Lead in 1912. Reviews the production and the market, giving information concerning the different districts. 3500 w. Eng & Min Jour—Jan. 11, 1913. No. 38982.

The Zinc Industry in 1912. Reviews the production and markets, the Joplin, Wisconsin, Colorado, and Oklahoma fields. 4500 w. Eng & Min Jour—Jan. 11, 1913. No. 38983.

Zinc Production and Smelting in 1912. R. G. Hall. Information concerning the various districts and methods of smelting.

Consult Classification of the Index. See page 9.

Smelters

2200 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38925 C.

Smelters

The American Zinc Smelter at Hillsboro, Illinois. Carpel L. Breger. Illustrates and describes the interesting features of the works, and their equipment and operation. 5000 w. Min & Engng Wld—Nov. 9, 1912. No. 37346.

Smelting

The Electric Furnace for Zinc Smelting. Peter E. Peterson. Illustrated discussion of different types of furnaces employed and the difficulties. 2500 w. Min & Engng Wld—May 31, 1913. Serial. 1st part. No. 42632.

Federal Lead Co.'s Smelting Plant. H. B. Pulsifer. Illustrated description of this plant near Alton, Ill., and its equipment and working. 2500 w. Min & Engng Wld—Aug. 30, 1913. No. 44873.

Spain

The Lead Industry in Spain. Information concerning the industry and mines, the deposits, smelters, prices, etc. 1800 w. Min Jour—July 26, 1913. Serial, 1st part. No. 44168 A.

Southern States

Copper, Lead, and Zinc in the Southern States. C. E. Siebenthal. Gives the production by states and other information. 2500 w. Mfrs' Rec — March 27, 1913. (Special.) No. 41563 N.

Sulphide Ores

The Problem of Mixed Sulphide Ores. W. R. Ingalls. Discusses the treatment of difficult zinc ores. 2500 w. Jour Can Min Inst—Vol. XIV. No. 42032 N.

White Lead

Manufacture of Sublimed White Lead. The sublimation process depends directly upon the oxidation of galena under intense heat in an oxidizing atmosphere. Ills. 1200 w. Eng & Min Jour—Feb. 22, 1913. No. 39997.

Wisconsin

Brief Notes on the Wisconsin Zinc Field. H. B. Pulsifer. Illustrated report of the different properties. 2500 w. Min & Engng Wld—Nov. 2, 1912. No. 37267.

Development of the Wisconsin Zinc Field. H. B. Pulsifer. First of a series of articles illustrating and describing the mines and reviewing the history of this field. 1500 w. Min & Engng Wld—June 21, 1913. Serial. 1st part. No. 43114.

Zinc

New Type of Wisconsin Zinc Deposit. G. H. Cox. Describes a new type of "flats and pitches" deposit called the "single pitch." 1200 w. Eng & Min Jour—Nov. 30, 1912. No. 37962.

LEAD AND ZINC**Zinc Production**

Some Recent Developments at Leadville. G. Montague Butler. Reviews briefly the history of minerals mined at Leadville since 1860, and discusses particularly the oxidized zinc minerals recently discovered. Ills. 4500 w. Ec-Geol.—Jan., 1913. No. 39951 D.

Zinc Dust

The Collection of Zinc Dust. P. Wilson. Brief description of an installation at the Autonienhütte works in Upper Siberia, where collection is made by means of a suction pump. 1000 w. Min Jour—May 10, 1913. No. 42278 A.

Specifications and Tests for Zinc Dust. A. M. Merton. Gives data useful in drawing up specifications. 1500 w. Min & Engng Wld—June 28, 1913. No. 43319.

Zinc Ferrite

Notes on the Formation of Ferrites in Roasting Blende. G. S. Brooks. Notes on the physical properties of zinc ferrite, the chemical composition, formation, temperature effect, etc. 3000 w. Bul Am Inst Min Engrs — May, 1913. No. 42459 F.

Zinc Metallurgy

The Metallurgy of Zinc. W. R. Ingalls. Reviews the past year, the experimental work and details. 2200 w. Eng & Min Jour—Jan. 11, 1913. No. 38989.

The Igneous Concentration of Zinc Ores. F. L. Clerc. A study of the conditions under which zinc oxidizes and suggestion for working a concentrating furnace. 4500 w. Eng & Min Jour—Jan. 25, 1913. No. 39378.

The Recovery of Zinc, the Great Problem in Mining. Arthur Lakes. Briefly considers the zinc industry in America, the trouble with zinc and the smelter, zinc values, concentration, etc. 2500 w. Min & Engng Wld—Jan. 18, 1913. No. 39232.

Zinc Mining

Electricity in Zinc Mining. Illustrated discussion of motor applications and power requirements of zinc-mining machinery. 4500 w. Elec Rev & W Elect'n — July 19, 1913. No. 43831.

Zinc Ores

Dressing Western Zinc Ores. Frank A. Bird. Suggestions for improving the product and increasing profits. 1800 w. Min & Sci Pr — March 1, 1913. No. 40325.

Zinc Production

Zinc Production at Broken Hill. Theodore J. Hoover. Gives a curve showing the production since 1900, and makes a forecast of future production. 700 w. Mining Mag—Jan., 1911. No. 39431 B.

Consult Classification of the Index. See page 9.

Zinc Smelting**Zinc Smelting**

Historical Note on Zinc Smelting. From Hoover's translation of Agricola. Con-

MINING**Canada**

cerning the early history and development of zinc. 2000 w. Eng & Min Jour—Oct. 18, 1913. No. 45938.

MINING**Accident Prevention**

Report of Committee on the Practice for the Prevention of Accidents. 1500 w. L Superior Min Inst—Aug. 26, 1913. No. 44591 N.

Safety in the Mines of the Lake Superior Iron Ranges. Edwin Higgins. Discusses existing conditions and offers suggestions. 6500 w. L Superior Min Inst—Aug. 26, 1913. No. 44588 N.

Moving Pictures as an Aid to Mine Accident Prevention. Describes their use in illustrating safe and unsafe methods. 2000 w. Col Engr—Sept., 1913. No. 44852 C.

Accidents

Cause and Prevention of Electricity Accidents in Mines. A summary by Mr. Robert Nelson, of the accidents due to the use of electricity in and about mines during the year 1911. 3500 w. Mech Engr—Jan. 17, 1913. No. 39470 A.

Accidents from Mine Cars and Locomotives. L. M. Jones. Gives statistics and precautions to be taken. 5000 w. U S Bureau of Mines—Circ. 11. No. 40415 N.

Metal Mine Accidents in the United States During the Calendar Year 1911. Compiled by Albert H. Fay. 8000 w. U S Bureau of Mines—Tech Paper 40. No. 41635 N.

Mining Accidents. Discusses conditions in England and the effects of the Eight Hours Act. 1200 w. Engr, Lond—May 23, 1913. No. 42755 A.

The Relative Hazard of all Vocations in Comparison with Mining. Hywel Davies. Gives statistics of industrial accidents, showing the relative hazards of vocations, and urges that the government gives all industrial accidents such supervision as will be fair to all industries. 3000 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44062 N.

Rand Mining Accidents and Deaths in 1912. Gives figures on the accident death rate for 1912, with analysis of causes. 3500 w. Eng & Min Jour—Oct. 11, 1913. No. 45806.

Accounting

See same heading, under INDUSTRIAL ECONOMY.

Africa

Mining in Katonga. R. H. Gwyn-Williams. Remarks on transportation rates, and information concerning the ore deposits, including copper, coal, gold, wolfram, platinum, galena, iron, and dia-

monds. 2500 w. Min Jour—Aug. 30, 1913. No. 45033 A.

Air Control

Air Control in Mines Subject to Spontaneous Combustion. J. W. McTrusty. Read before the Nat. Assn. of Col. Engrs. Considers the control of quantity, and the control of quality or composition. Discussion. 4500 w. Ir & Coal Trds Rev—May 2, 1913. No. 42251 A.

Anemometer

The Measurement of Air in Mines. Henry Louis. Abstract of a lecture at Newcastle. Discusses the methods used in measuring ventilating currents, and illustrates and describes Prof. Louis' new indicating anemometer. 3000 w. Col Guard—June 20, 1913. No. 43385 A.

Blasting

Electric Shot Firing. Lucina L. Wittich. Illustrated description of apparatus designed to permit shots to be fired from the surface at will in any part of the mine. 2500 w. Mines & Min—Dec., 1912. No. 38003 C.

A New Type of Electric Fuse for Blasting. Section and description of a fuse designed to prevent misfires, or partial misfires, when firing shots in series. 700 w. Col Guard—Feb. 28, 1913. No. 40481 A.

Shotfiring and Watering Systems in Utah Mines. John E. Ambrose. A description of electric shotfiring and of the spraying system in use. 2000 w. Coal Age—Oct. 11, 1913. No. 45785.

The Use of Squibs for Shot-Firing. Committee report, giving description of squibs and methods of using them; discussing relative safety of the methods of firing shots and giving conclusions and recommendations. 3000 w. Col Guard—April 11, 1913. No. 41388 A.

Bore-Hole Surveying

Notes on Bore-Hole Surveying. Sidney L. Wise. Outlines the obstacles encountered and the results obtained in a recent survey of a series of holes. 800 w. Sch of Mines Qr—Jan., 1913. No. 40761 D.

Canada

Economic Minerals and Mining Industries of Canada. A sketch of the more important economic minerals and of the mining and metallurgical industries. Maps. Ills. 77 pp. Can Dept of Mines—No. 230. No. 45408 N.

Consult Classification of the Index. See page 9.

Churn Drilling**Churn Drilling**

Churn Drilling in Southwestern Wisconsin. W. F. Boericke. Describes churn-drilling prospecting methods at relatively shallow depths in this zinc field. 2500 w. Eng & Min Jour—Aug. 30, 1913. No. 44888.

Classification

The Quantitative Mineralogical Classification of Gradational Rocks. Frances Church Lincoln. Aims to give logical quantitative mineralogical classifications of gradational rocks. 4000 w. Ec Geol—Sept., 1913. No. 45826 D.

Compressed Air

The Compressed Air System of the Anaconda Copper Mining Co., Butte, Mont. Bruno V. Mordberg. Explains the conditions, describing the plant and compressor station, the mechanism of the air hoist, and other details, and stating the advantages claimed. Ills. 13500 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45464 F.

Cost Keeping

Mine Cost Keeping. C. M. Eye. Brief description of a recently installed system. 600 w. Min & Sci Pr—Aug. 16, 1913. No. 44529.

Costs

Operating Costs of California Mines. Charles Janin. Gives operating costs of several California mines. Ills. and map. 3000 w. Min & Sci Pr—Oct. 26, 1912. No. 37178.

Cost of Working Thin Veins at the Standard Consolidated Mine. C. E. Grunsky, Jr. Describes methods used in mining very narrow veins of ores carrying only gold and silver, giving tabulated costs. 1200 w. Min & Sci Pr—May 31, 1913. No. 42617.

Cost of Mining as Related to Output. R. C. Jones. Gives figures showing variation of cost with varying output. Gives suggestions for new basis for car allotment. 3000 w. Col Engr—Oct., 1913. No. 45643 C.

Mining Costs in the Missouri-Kansas District. Charles W. Burgess. Gives an analysis of the factors making up the mining cost, describing briefly the equipment of mining plant, geology, exploitation of the bodies, and methods of mining and milling. Ills. 3000 w. Min & Engng Wld—April 26, 1913. No. 41652.

See also Accounting, under **INDUSTRIAL ECONOMY**, and Rand, under Mining and Metallurgy, *Gold and Silver*.

Detonators

Investigations of Detonators and Electric Detonators. Clarence Hall and Spencer P. Howell. Gives a short discussion

MINING

of the theory of detonation and report of investigation to determine the relative strength of detonators and electric detonators having different compositions. Ills. 73 pp. U S Bureau of Mines—Bul 59. No. 44487 N.

Drainage

A Study on the Question of the Damages Effected by Mine Drainage (Ein Beitrag zur Frage der Bergschäden durch Wasserentziehung). Herr Kegel. The geological effects from the removal of underground flow. Ills. 6300 w. Glückauf—Feb. 15, 1913. No. 40512 D.

Dredges

Bucket Dredges for Nigerian Tin Deposits. Illustrated description. 900 w. Engng—March 14, 1913. No. 40825 A.

Natoma No. 10, an All-Steel Dredge. Lewis H. Eddy. Illustrated detailed description of this dredge, completed in 1912, for use in California. 3500 w. Eng & Min Jour—May 31, 1913. No. 42639.

Drilling

Surveying and Sampling Diamond Drill Holes. E. E. White. Describes methods used, with changes suggested by experiences. Ills. 5000 w. Bul Am Inst of Min Engrs—Nov., 1912. No. 37549 F.

The Significance of Recent Drill Results at Birmingham, Ala. Edwin C. Eckel. Discusses the Alabama ore estimates. 2500 w. Mfrs' Rec—Nov. 14, 1912. No. 37553.

Results of Recent Drilling of the Clinton Ore in the Birmingham District. David Hancock. An account of the excellent results obtained. Also remarks of Y. A. Dyer on the "Significance of These Discoveries of Alabama Ore." 2500 w. Mfrs' Rec—Nov. 7, 1912. No. 37301.

Work Done by Calyx Core Drills on Estacada Hydro-Electric Development, River Mill Dam. Extracts from a report of Frank R. Fisher, on the grouting of the foundation for the cutoff, with special reference to the use of calyx drills. Ills. 2200 w. Compressed Air—May, 1913. No. 42421.

A Cost and Time Study of Big Blast Hole Drilling. R. R. Sanderson. Read before the Nat. Lime Mfrs. Assn. 4500 w. Cement & Eng News—Aug., 1913. Serial, 1st part. No. 44276.

Rock-Drill Testing at the North Star. Robert H. Bedford and William Hague. A report of tests and results. Ills. 1200 w. Min & Sci Pr—Aug. 2, 1913. No. 44221.

The Davis Calyx Drilling Method (Die Davis-calyx-boormethode). H. Tromp. The drills and apparatus used by this deep-drilling process for mines, oil-wells,

Drilling

Drills

or artesian wells. Ills. 7500 w. *De Ingenieur*—Aug. 16, 1913. No. 44697 D.

The Present Status of Deep Drilling Science (Der gegenwärtige Stand der Hochbohrtechnik). O. Döbelstein. An account of recent experience with drills in Dortmund. Ills. Serial, 1st part. 2100 w. *Glückauf*—Aug. 9, 1913. No. 44621 D.

Rock-Drilling Economies. W. L. Saunders. Shows the importance of the rock-drill in industrial progress, traces its development, and illustrates and describes types of modern drills. 6500 w. *Bul Am Inst of Min Engrs*—Sept., 1913. No. 45463 F.

Diamond-Drilling at the Poderosa Mine. C. L. Severy. Explains conditions attending drilling a high altitude mine in Bolivia. 1600 w. *Min & Sci Pr*—Aug. 30, 1913. No. 44949.

See also Churn Drilling, under *Mining*.

Drills

Improvements in Rock Drills and Drill Sharpeners. F. B. McDonald. Describes old and new styles. Ills. 2000 w. *Min & Engng Wld*—Jan. 11, 1913. No. 37118.

Special American Drills for Deep Rock Cutting. Illustrated descriptions of the deep-hole traction drill and the churn drill. 2700 w. *Engr, Lond*—June 13, 1913. No. 43150 A.

Notes on Drills and Drilling. F. R. Parsons. Discusses the machine, grinding drills, drill grinding gauge, repairing shank ends, etc., in the present number. Ills. 1200 w. *Mech Wld*—June 20, 1913. Serial, 1st part. No. 43381 A.

Pneumatic Drills in Competition with Electric Drills. Describes the Fort Wayne, Pneumelectric and the Dulles-Baldwin electric drills used in the construction of the new Catskill aqueduct and the deep tunnels in the city of New York for the water supply. After a year's trial their use was abandoned and air drills installed. 2500 w. *Sib Jour of Engng*—Oct., 1913. No. 46292 C.

Mine and Tunnel Equipment. Charles A. Hirschberg. An account of improvements in mine drills and their operation. Ills. 1200 w. *Compressed Air*—April, 1913. No. 41211.

Earthquakes

Earthquakes in Mines. James Douglas. Reviews the history of earthquake activity in the St. Lawrence Valley, especially considering effects below the surface. 3000 w. *Jour Can Min Inst*—Vol. XIV. No. 42019 N.

See also Explosions, under *Coal and Coke*.

Earth Settlement

The Mechanical Action of Mining on the Retention of Rock (Die mechanischen

MINING

Einwirkung des Abbaues auf das Verhalten des Gebirges). A. Eckardt. A study of the reaction taking place between mine workings and earth pressure, mine roofs being retained due to arch action in the overlying masses. Ills. Serial. 1st part. 5600 w. *Glückauf*—March 8, 1913. No. 41413 D.

Efficiency

Obtaining Efficiency in Mining. André Formis. Shows that attention to drilling, shoveling, pumping, etc., will greatly reduce costs. 2500 w. *Eng & Min Jour*—Dec. 28, 1912. No. 38583.

Electric Hoisting

Tests on an Electrically Controlled Centrifugal Brake (Versuche mit einer elektrisch gesteuerten Fliehkraftbremse). Herr Kammerer. Description and discussion on the Becker Centrifugal Brake, especially adapted to hoists, cranes, etc. Ills. 3400 w. *Zeitschr des Ver deutscher Ing*—Nov. 30, 1912. No. 38452 D.

Electric Hoists

Electric Winding Engines. A. E. du Pasquier. Abstract of a paper read before the S. Wales Inst. of Engrs. Considers the more important principles underlying the selection and design of the most suitable type for any particular conditions. 3000 w. *Elect'n, Lond*—Nov. 15, 1912. No. 37808 A.

Discussion on "Electrical Control of a Large Mine Hoist," Pittsburgh, Pa., April 27, 1912. The paper by H. W. Cheney is discussed. 3000 w. *Pro Am Inst of Elec Engrs*—Nov., 1912. No. 37899 F.

Plant Costs and Operative Efficiency in Electrically Driven Mine Hoists (Anlagekosten und Wirkungsgrad bei elektrisch betriebenen Hauptschachtfördermaschinen). Karl Meller. Comparative methods of determination. Diagrams. 2000 w. *Glückauf*—Oct. 19, 1912. No. 37411 D.

Electric Hoists for Mine Service. H. A. Russell. Read before the California Mines' Assn. Discusses the advantages and the selection of a motor, controlling apparatus, etc. Ills. 3000 w. *Min & Sci Pr*—Feb. 8, 1913. 39849.

The Reconstruction of Electric Hoists Through the Introduction of A. C. Commutator Motors and Improved Safety and Control Devices (Die Neugestaltung der elektrischen Fördermaschine durch die Einführung des Wechselstrom-Kommutatormotors und neuartiger Sicherheits- und Steuereinrichtungen). Ludwig Thallmayer. Review of modern design. Ills. Serial, 1st part. 3300 w. *Elek Kraft u Bahnen*—Jan. 4, 1913. No. 40059 D.

Electric vs. Compressed Air Hoists. K. A. Pauly. A reply to Mr. Nordberg's discussion of a paper presented by the

Consult Classification of the Index. See page 9.

Electric Power

writer at the Wilkes-Barre meeting of the Am. Inst. of Min. Engrs. Ills. 6000 w. Eng & Min Jour—March 29, 1913. No. 40954.

The Importance of Hoist Investigations. George E. Edwards. Observations on details to be considered in motor driven hoists. 2000 w. Min & Engng Wld—April 19, 1913. Serial. 1st part. No. 41361.

Recent Electric Hoists with Three-Phase Drive (Neuere Arten elektrischer Fördermaschinen mit Drehstromantrieb). Herr Masling. Describes recent types constructed by Siemens-Schuckert, and Brown, Boveri & Co. Ills. 5000 w. Glückauf—Dec. 7, 1912. No. 39004 D.

See also A. C. Motors, under Electrical Engineering, *Dynamos and Motors*.

Electric Power

Electricity in Metal Mining in Colorado. W. J. Canada. Illustrates and describes its use for driving hoists, pumps, drills, fans, railways and in various processes connected with the recovery of precious metal from ore. 4500 w. Elec Wld—Dec. 7, 1912. No. 38097.

The Thury System of Electrical Transmission of Power for Mines. Sydney F. Walker. Diagrams and explanation of the system and statement of its advantages. 3000 w. Ir & Coal Trds Rev—Feb. 7, 1913. No. 39922 A.

The Use of Electricity and Electrical Accidents in Mines. Information from a report of the Electrical Inspector of Mines in England. 2500 w. Elec Rev, Lond—Feb. 14, 1913. Serial. 1st part. No. 40115 A.

Main and Auxiliary Plants with Turbo-Machines for Mining Operations (Haupt- und Hilfsanlagen mit Turbo-maschinen in neuzeitlichen Grubenbetrieben). Ernst Blau. Reviews the application of turbo-motors, turbo-pumps, turbo-generators, turbo-compressors, etc., in mine-work. Ills. 2400 w. Elek u Masch—Jan. 26, 1913. No. 40058 D.

Electric Equipment, American Nettie Mine. T. A. Tefft. Describes the method of constructing the hydro-electric plant that furnishes power for this Colorado mine, giving results of efficiency tests. 2000 w. Eng & Min Jour—March 15, 1913. No. 40664.

Electricity in Mines. H. S. Webb. An explanation of what electricity is, its manifestations, positive and negative electricity, etc. 1000 w. Col Engr—March, 1913. Serial. 1st part. No. 40281 C.

Electrical Plant of El Guindo Co., Spain. C. A. Tupper. Describes the deposits and the general conditions under

MINING

which the work is carried on, illustrating and describing the various plants. 2000 w. Min & Engng Wld—March 8, 1913. No. 40380.

Central Station Power for Mines. J. S. Jenks. Historical sketch of the West Penn system in regard to its electrical service in connection with coal mines. 2000 w. Pro Am Inst of Elec Engrs—April, 1913. No. 41676 F.

Use of High-Tension Direct-Current Thury System in Mines. Sidney F. Walker. Abstract of paper read before the Inst. of Elec. Engrs. (England). Describes the system and its applications. Ills. 3500 w. Elec Wld—April 12, 1913. No. 41191.

A Plea for the Use of High-Tension Constant Continuous Currents in Mines. Sydney F. Walker. Explains the advantages of the system, its economy, etc. 3500 w. Elec Rev, Lond—Dec. 27, 1912. No. 38863 A.

Application of Motors in Mining and Mill Installations in Colorado. W. J. Canada. Gives data on a number of actual installations in Colorado. The motor equipment of the various departments are given in tabular form. 1600 w. Elec Wld—April 5, 1913. No. 41109.

Electric Power at California Mines. Warren Aikens. Illustrates and describes plants operated by the Pacific Gas & Electric Co. 2000 w. Min & Engng Wld—April 26, 1913. Serial. 1st part. No. 41653.

Electric Power Installation at El Tigre, Sonora, Mexico. James W. Malcolmson. Explains conditions and the propositions considered in a study of the best manner to obtain power, describing the installation. 1800 w. Bul Am Inst of Min Engrs—April, 1913. No. 41660 F.

Power Supply on the Rand. A. E. Hadley. Abstract of a paper read before the Manchester Sec of the Inst. of Elec. Engrs. Describes the power stations, transmission system, protection arrangements, control, etc. Ills. 6000 w. Mech Engr—April 4, 1913. No. 41228 A.

The Application of Energy to Mining in the Coeur d'Alenes. J. B. Fiskens. Reviews briefly the history of the application of electricity in mining, and especially in the Coeur d'Alene country. 4000 w. Bul Am Inst of Min Engrs—June, 1913. No. 43253 F.

Electrical Distribution for Mines. J. W. Anson. Abstract of a paper read before the S. African Inst. of Elec. Engrs. Deals especially with mines which draw their energy from a transformer house which transforms current taken from the

Enrichment

power supply into current suitable for use in the mine. 3000 w. *Ir & Coal Trds Rev.*—Sept. 5, 1913. No. 45199 A.

* Use of Electricity in Mining in the Butte District. John Gillis. Considers briefly the principal applications of electric current in metal mining. 1000 w. *Bul Am Inst of Min Engrs*—Sept., 1913. No. 45467 F.

The Use of Electric Power in Mining Operations. S. Rice. Explains how central power stations in the coal and coke districts of Penn. effect operating economies, with details of the Ebensburg Coal Co.'s plant. 3000 w. *Ir Trd Rev.*—Sept. 25, 1913. No. 45438.

Application of Electric Power to Mining Work. C. A. Tupper. Illustrates and describes recent development in the use of high speed air compressors and synchronous motors on the Lake Superior ranges. 3000 w. *Ir Trd Rev.*—Jan. 2, 1913. (Special.) No. 38740 D.

See also Electric Power, under *Coal*, and *Coke*, and under *Gold and Silver*; Mine Pumps, under *Mining*; and Safety Appliances, under *ELECTRICAL ENGINEERING, Transmission*.

Enrichment

An Example of Secondary Enrichment. W. F. A. Thomae. Describes the ore deposit of the Cata Arroyo mine in the State of Zacatecas, Mexico. Ills. 2000 w. *Inst of Min & Met*, *Bul* 109—Oct. 9, 1913. No. 46391 N.

Secondary Enrichment in the Caledonia Mine, Cœur D'Alene District, Idaho. Earl V. Shannon. The mine has yielded considerable high grade silver, copper and lead ore. Notes on the changes of the character of the ores with depth. 2000 w. *Ec-Geol*—Sept., 1913. No. 45827 D.

Exhibition

The Mining Exhibition at the Agricultural Hall, Islington, London. Brief account of the opening, with illustrated description of the exhibits. 20000 w. *Ir & Coal Trds Rev.*—May 30, 1913. (Supplement.) Serial. 1st part. No. 42790 A.

Experimental Station

The Westphalian Experimental Station at Derne. Messrs. Beyling and Zix. From *Glückauf*. Description of the new testing station and its equipment. Ills. 2700 w. *Col Guard*—April 4, 1913. No. 41236 A.

The Testing Gallery at Derne (Die Versuchsstreckenanlage in Derne). Herrn Beyling and Zix. An experimental gallery of connected large iron pipes for determining the force of explosives, and other purposes. Ills. 4900 w. *Glückauf*—March 22, 1913. No. 41417 D.

Exploration

An Electrodynamical Method for Exploring the Earth's Crust (Eine elektrodyna-

MINING

mische Methode zur Erforschung des Erdinnern). Heinrich Löwy and G. Leimbach. Report of some interesting underground wireless experiments. Ills. Serial. 1st part. 1400 w. *Oest Zeit f Berg u Hüttenwesen*—Nov. 2, 1912. No. 38413 D.

Explosions

Gaseous Explosions. Presented to Sec. G. of the British Assn., Sept. 5, 1912. Fifth report of the Committee appointed for the investigation of gaseous explosions, with special reference to temperature. 5000 w. *Engng*—Nov. 8, 1912. No. 37643 A.

The Prevention of Explosions in Mines. John Harger. Explains a method of preventing dust explosions and fires in mines and elsewhere by reducing the oxygen content and the addition of small per cents of carbon dioxide. Discussion. 1400 w. *Trans Manchester Geol & Min Soc*—Feb., 1912. No. 39565 N.

See Stray Currents, under *ELECTRICAL ENGINEERING, Transmission*.

Explosives

Storage of Explosives at Mines. The requirements as explained in a memorandum issued by the Home Office. 2500 w. *Col Guard*—Nov. 15, 1912. No. 37821 A.

Smokeless Powders and Explosives for Military Use. Odus C. Horney. Describes modern explosives and their manufacture. 7500 w. *Pro Engrs' Club of Phila*—Oct., 1912. No. 37711 D.

The Energy of Explosives. Dr. Walter O. Snelling. Aims to show that explosives suitable for certain work can be best selected through knowledge of the energy factors and energy requirements. Discussion. Ills. 11000 w. *Pro Engrs' Soc of W Penn*—Nov., 1912. No. 38397 D.

Monobel and Carbonite. Information concerning "permissible explosives" and the circumstances to which each is suited. 2400 w. *Mines & Min*—Dec., 1912. No. 38005 C.

Explosives. J. K. Moore. Discusses different types of explosives, their efficient use, and details of the proper handling. 3500 w. *Can Engr*—April 3, 1913. Serial. 1st part. No. 41100.

The Selection of Explosives Used in Engineering and Mining Operations. Clarence Hall and Spencer P. Howell. Deals with the characteristics of the principal explosives used, and especially with tests that show the suitability of different classes of explosives for different kinds of work. Ills. 50 pp. U S Bureau of Mines—Bul 48. No. 41399 N.

The Testing of Safety Explosives. Vivian B. Lewes. Critical discussion of present regulations for testing and the nature and characteristics of explosives

Consult Classification of the Index. See page 9.

Explosives

that pass the permitted list. General discussion. 10000 w. Jour Soc of Arts—April 4, 1913. No. 41218 A.
 "Ignitions" and "Explosions." Summary of evidence given in an important test case in Scotland. 3500 w. Col Guard—March 28, 1913. No. 41141 A.

Modern Explosives and Their Use. F. H. Gunsolus. Brief outline of the history of explosives and their testing. Discussion. 3500 w. Jour Cleveland Engng Soc—May, 1913. No. 42432 D.

Permissible Explosives Tested Prior to March 1, 1913. Clarence Hall. Gives definition of permissible explosives and list. 1500 w. U S Bureau of Mines—Tech. paper 52. No. 43293 N.

On a Modified Form of Stability Test for Smokeless Powder and Similar Materials. H. C. P. Weber. An investigation of the explosion temperature. 2000 w. Bul Bureau of Stand—March 15, 1913. No. 42935 N.

Note on the Quantitative Determination of Nitrous Fumes in Firing (Cheesa) Sticks. Dr. L. Heymann. Explains methods for the determination of nitrous fumes. Discussion. 2200 w. Jour Chem, Met & Min Soc of S Africa—April, 1913. No. 42870 E.

The Analysis of Black Powder and Dynamite. Walter O. Snelling and C. G. Storm. Outlines the methods of analysis used by the U. S. Bureau of Mines in the examination of certain classes of explosives. Ills. 80 pp. U S Bureau of Mines—Bul. 51. No. 43615 N.

The Testing of Explosives. A memorandum issued in regard to the test of explosives for inclusion in the Permitted List. 3000 w. Col Guard—Aug. 15, 1913. No. 44721 A.

Explosives Testing Station at Rotherham. Describes the gallery, gas connections, the gun, and the test. Ills. 3000 w. Ir & Coal Trds Rev—Aug. 15, 1913. No. 44734 A.

The Effect of Incombustible Dusts on the Explosion of Gases. H. B. Dixon and Colin Campbell. Evidence seems to show that such dust has a quenching effect. 3300 w. Sci Am Sup—Aug. 23, 1913. No. 44503.

External Stemming with Incombustible Dust. V. Watteyne and E. Lemaire. From *Ann. de Mines de Belgique*. Describes the method of external stemming and the occurrence of blow-out shots, and successful shots. Ills. 2500 w. Ir & Coal Trds Rev—Aug. 15, 1913. No. 44733 A.

Belgian Shot-Firing Experiments. Illustrated reports of further tests with external tamping. 2500 w. Col Guard—

MINING

Aug. 15, 1913. No. 44720 A.

See also Detonators, under *Mining*.

Filling

Filling of Mine Stopes with Mill Tailings. W. H. Storms. Explains what has been accomplished in other countries, and how to convey the sand. 3500 w. Min & Engng Wld—Jan. 18, 1913. No. 39234.

Sand Available for Filling Mine Workings in the Northern Anthracite Basin of Pennsylvania. N. H. Darton. Observations concerning the character and distribution of the unconsolidated materials available. Ills. 33 pp. U S Bureau of Mines—Bul. 45. No. 40414 N.

Fire Protection

Fire Protection Above and Below Ground. G. E. Lyman. A summary of methods used in fireproofing mines. Ills. 2200 w. Coal Age—May 17, 1913. No. 42207.

Fire Protection and Fireproofing in Mines. Herbert M. Wilson. Remarks on the heavy loss of life and property through mine fires; and discussion of methods of fireproofing, and related subjects. 2500 w. Min & Sci Pr—May 24, 1913. No. 42511.

Fires

Causes of Fires in Metal Mines. T. A. Tefft. The extensive use of timber furnishes conditions for dangerous fires. Methods of extinguishing are briefly considered. 2500 w. Mines & Min—Nov., 1912. No. 37191 C.

Forestry

Forestry and Related Mining. Frank D. Rash. Read before the Kentucky Min. Inst. Gives the experience of St. Bernard Mining Co. in planting different kinds of trees in Kentucky. 1500 w. Col Engr—April, 1913. No. 40975 C.

Framing

Rocker Timber-Framing Plant of Anaconda Co. Claude T. Rice. Illustrated description of plant and its equipment. 2500 w. Min & Engng Wld—March 1, 1913. No. 40298.

Erection of MacNamara Head-Frame. Herbert Haas. Illustrated description of the erection. 2000 w. Min & Sci Pr—March 1, 1913. No. 40323.

Geology

Depths and Continuity of Fissure Veins and Their Ore. Arthur Lakes. Illustrated explanation of such veins and information concerning their phenomena. 2500 w. Min & Engng Wld—Dec. 14, 1912. No. 38210.

Relation of Shearage Zones and Mineral Veins. Arthur Lakes. Illustrated explanation of shearage zones and veins crossed by such disturbances. 1100 w.

Consult Classification of the Index. See page 9.

Geology

Min & Engng Wld—Nov. 30, 1912. No. 37956.

A Review of the Existing Hypotheses on the Origin of the Secondary Silicate Zones at the Contacts of Intrusion with Limestones. W. L. Uglov. Reviews available literature on this subject and the evidence supporting the two opposing hypotheses. 7500 w. Ec-Geol—Jan., 1913. Serial, 1st part. No. 39952 D.

"Chimney" or "Pipe" Deposits in the Porphyries. Walter Harvey Weew. Illustrated descriptions of such deposits. 3000 w. Min & Engng Wld—Feb. 22, 1913. No. 39985.

Graphics Applied to Fault Problems. E. R. Rice. Shows that given sufficient data, the degree and direction of the movement may be ascertained. 2500 w. Eng & Min Jour—March 22, 1913. No. 40756.

The Ultimate Source of Metals. Blarney Stevens. Reviews the theories and explanations advanced to account for the distribution of metals. 4000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40889 F.

Replacement Deposits in the Ajax Mine. E. A. Colburn, Jr. Describes the large replacement orebodies and interesting geological occurrences. Plans. 2000 w. Eng & Min Jour—April 12, 1913. No. 41187.

Elements of Field Geology and Geological Surveying. James Park. Suggestions for the field geologist, describing necessary field equipment, field procedure, observations, etc. 6000 w. Aust Min Stand—April 10, 1913. No. 42259 B.

The Dispersion of Metals. Lynde P. Wheeler. An examination of available data on the dispersion of silver, copper, gold, nickel, and cobalt, with conclusions. 5000 w. Am Jour of Sci—May, 1913. No. 42423 D.

Successive Phases of Mineralization in Veins of Volcanic Regions. Waldemar Lindgren. Describes replacements observed. 1600 w. Jour Can Min Inst—Vol. XV. No. 42042 N.

Searching for Oreshoots in Veins. George E. Collins. Part of an address delivered before the Colo. Sci. Soc. A discussion of the value of geologic theories as guides in exploration. 4500 w. Eng & Min Jour—May 10, 1913. No. 41960.

Graphical Determination of Dip and Strike. R. Clyde Cameron. Considers finding the dip and strike of a vein graphically with the elevations of the projected points shown by contour lines. Ills. 800 w. Min & Sci Pr—May 31, 1913. No. 42619.

MINING

Headgears

The Laws of Jointing. Blarney Stevens. A full explanation of the phenomena of rock jointing, accounted for, to a large extent, by water pressure in the rock pores. Ills. 5800 w. Bul Am Inst Min Engrs—July, 1913. No. 44018 F.

The Formation of Metalliferous Deposits. Extracts from a lecture delivered to the Société de l'Industrie Minière discussing the genesis of mineral deposits. 2000 w. Min Jour—June 28, 1913. No. 43628 A.

Economic Geology of the Berea Sandstone Formation of Northern Ohio. Wilbur Greeley Burroughs. A study of the Berea sandstone of Ohio, methods of quarrying, economic development, etc. 4500 w. Ec-Geol—Aug., 1913. No. 44383 D.

See also Microscopy, under *Mining*.

Haulage

The Haulage Installation at the Mines of Friedenshütte, Upper Silesia (Fördereinrichtungen der Friedensgrube in Friedenshütte, O.-S.). O. Putz. The layout of the workings, locomotive installation, compressor plant, etc. Ills. 3000 w. Glückauf—Aug. 30, 1913. No. 45394 D.

Compressed-Air Mine Haulage. William Z. Price. Discussion of the system, method of charging, and the operation of air locomotives at Maple Hill Colliery. Ills. 2500 w. Col Engr—Oct., 1913. No. 45638 C.

Slope Haulage at Sayreton, Alabama. F. G. Morris. Methods of construction and operation are described by which a record production has been obtained on a slope 5,510 feet long. 1200 w. Col Engr—Oct., 1913. No. 45642 C.

Rope Haulage at Vesta No. 4 Mine. William Z. Price. Illustrated description of the system in operation at California, Pa., having a capacity of 6000 tons per day. 2000 w. Col Engr—Oct., 1913. No. 45636 C.

Practical Mule Haulage. A. E. Thompson. Discusses conditions under which mule haulage is economical. 1500 w. Col Engr—Oct., 1913. No. 45646 C.

Animal Haulage in Mines. Beverley S. Randolph. Information concerning the type of mule which experience has shown to be most economical. Ills. 2500 w. Col Engr—Oct., 1913. No. 45637 C.

See also Mine Locomotives, under *Mining*.

Headframes

Types of Headframes. H. L. Botsford. Illustrates and describes types. 1200 w. Eng & Min Jour—Oct. 11, 1913. No. 45805.

Headgears

Notes on Headgears for Collieries and Other Mines. F. Tissington. Illustrated

Consult Classification of the Index. See page 9.

Hoisting

detailed description of the development and types and matters related. 3500 w. Can Engr—Feb. 20, 1913. No. 39969.

Hoisting

Compressed-Air Hoisting at Butte. Thomas T. Read. Diagrams and description of the hoisting shafts of the Anaconda Copper Mining Co. and the compressed air system. 1700 w. Min & Sci Pr—Nov. 2, 1912. No. 37310.

Hoisting Practice in Wisconsin Zinc Fields. W. F. Boericke. Describes the arrangements for bucket hoisting. 1800 w. Eng & Min Jour—Jan. 4, 1913. No. 38810.

See also Ore Handling, under **MECHANICAL ENGINEERING, Transporting and Conveying**, and Electric Hoists and Winding Engines, under **Mining**.

Hoisting Buckets

Four-Decked Cage at St. Michael. Describes a new method of hoisting coal which admits of rapid handling of the cars and gives large capacity to the shaft. Ills. 2000 w. Col Engr—Aug., 1913. No. 44117 C.

Hoisting Buckets or Skips in German Mining (Die Gefäss-Schachtförderung, Skipförderung, und der deutsche Bergbau). Herr Herbst. Describes various German arrangements of mine superstructure for the handling of the buckets. Ills. Serial, 1st part. 4200 w. Glückauf—Aug. 2, 1913. No. 44619 D.

Mechanical Charging Devices for Hoist Buckets (Maschinelle Beschickungsvorrichtungen für Förderkörbe). Herr Wintermeyer. Detailed description of several devices being exploited in Germany. Ills. 2600 w. Glückauf—Aug. 16, 1913. No. 45384 D.

Hoisting Cables

Hoisting Cables for Deep Mines (Die Förderseile für grosse Schachtteufen). F. Baumann. Sizes and weights of cables for varying depths with a factor of safety of 6. Diagrams. 2800 w. Glückauf—Oct. 4, 1913. No. 46009 D.

Hoisting Cages

Parachute Hoisting Cages (Les Parachutes de Cages d'Extraction). L. Crusard. Describes systems of automatic safety catches for hoisting cages. Ills. Serial, 1st part. 5400 w. Tech Mod—Dec. 1, 1912. No. 38488 D.

Hoisting Engines

Air-Balanced Hoisting Engine. R. H. Corbett. Illustrated description of a device for which the power developed by the descending skip compresses air to be used in hoisting. 1600 w. Mines & Min—Nov., 1912. No. 37192 C.

Apparatus for Control of Over-Speeding and Over-Winding in Winding En-

MINING

gines. From the report of the W. Aust. Dept. of Mines. Particulars of some appliances recently introduced for prevention of undue speed. Ills. 4000 w. Can Min Jour—Nov. 1, 1912. No. 37276.

Charts for Hoisting Engines with Series-Wound Motor Drive (Zeichnerische Diagrammermittlung für Fördermaschinen mit Antrieb durch Reihenschlussmotoren). Gregor Treßer and Fritz Nettel. Considers hoisting engines with driving pulleys and cylindrical and conical drums. Charts. Serial, 1st part. 4900 w. Zeit des Ver deutscher Ing—June 14, 1913. No. 43530 D.

See Safety Devices, under **Mining**.

Hoisting Ropes

Rope Safety in Shaft Hoisting (Seilsicherheit bei der Schachtförderung). D. F. Baumann. Tabulated data on the allowable factor of safety of ropes of varying sizes and lengths. Charts. 2400 w. Glückauf—Dec. 14, 1912. No. 39006 D.

Prussian Statistics on Mine Cables for 1911 (Ergebnisse der preussischen Seilstatistik für das Jahr 1911). F. Bürklein. Report on tests made at the various stations. Ills. Serial, 1st part. 3500 w. Glückauf—April 5, 1913. No. 41421 D.

Hoists

Automatic Closing Device, System "Karlik-Nählik," for Inclined Hoists in the Rossitz-Oslawaner Coal District (Selbsttätige Absperrvorrichtung, System "Karlik-Nählik," für tonnlägige Förderung im Rossitz-Oslawaner Steinkohlenreviere). Julian Czaplinski. A bar at the level opening, automatically placed in the absence of the bucket skip. Ills. 1500 w. Oest Zeit f Berg u Hutten—Aug. 9, 1913. No. 44623 D.

The Electric Mine Hoist at Shaft II of the Rheinpreussen Homberg Mine on the Rhine (Elektrische Hauptschachtfördermaschine auf Schacht II der Zeche Rheinpreussen Homberg a. Rh.). W. Philipp. Details of the main hoist in use. Ills. 5000 w. Elek Kraft u Bahnen—July 24, 1913. No. 44682 D.

Electric-Driven Mine Hoists with Turbine-Driven Starting Motors (Elektrisch betriebene Hauptschacht-Fördermaschinen mit Dampf-turbinenantrieb der Anlassdynamo). Ernst Blau. General description and uses of combination machinery. Ills. Serial, 1st part. 2800 w. Elek u Masch—Sept. 7, 1913. No. 46079 D.

Hydraulic Mining

Principles of Hydraulic Mining. H. L. Mead. Outlines the different types of gravel deposits and describes methods of

Consult Classification of the Index. See page 9.

Hygiene

working. Ills. 4000 w. Sch of Mines Qr—April, 1913. No. 41693 D.

Hydraulic Elevator Work on Anvil Creek, Nome, Alaska. C. W. Purington. Illustrates and describes the handling of unfrozen gravel by the hydraulic nozzle with the accompaniment of the hydraulic lift and tailing nozzle. 2000 w. Min & Sci Pr—April 26, 1913. No. 41807.

A Study of rifles for Hydraulicking. Pierre Bouery. Gives results of experiments made to determine saving capacities. Ills. 3500 w. Eng & Min Jour—May 24, 1913. No. 42383.

Hygiene

Health and Living Conditions on Rand Mines. Describes conditions and discusses improvements still needed. 2500 w. S African Min Jour—Sept., 1912. (Special.) No. 37869 N.

Miners' Phthisis on the Rand. Frederick L. Hoffman. Report of the miners' phthisis commission for the government of the Union of South Africa. 3000 w. Eng & Min Jour—Nov. 30, 1912. Serial 1st part. No. 37961.

The Sanitation of Mining Towns. J. H. White. Excerpts from an address before the senior sanitary engineers, University of Pittsburgh. 2200 w. Eng & Min Jour—July 12, 1913. No. 43667.

See also Miner's Baths, under *Mining*, Nystagmus, under *Coal and Coke*, and Industrial Diseases, under *Industrial Economy*. See also Sanitation, under *Civil Engineering, Municipal*.

Illinois

Co-operative Mining Investigations in Illinois. H. H. Stoek. Outlines work in progress. 1500 w. Jour Can Min Inst—Vol. XV. No. 42047 N.

Korea

Mining on the Suan Concession. Information on the present position of the company. Ills. 2500 w. Min & Sci Pr—Aug. 16, 1913. No. 44528.

Labor

Labor Conditions at Copper Range. Claude T. Rice. Explains the policy that explains the stable labor conditions of the Lake Superior district. Ills. 2500 w. Eng & Min Jour—Dec. 28, 1912. No. 38585.

Labor in the Mines of Western America. H. F. Davis. Information concerning the miners and their efficiency, their habits of life and mining work. 4000 w. Min & Sci Pr—Feb. 1, 1913. No. 39674.

Labor and Other Costs. J. D. Kendall. Explains a system of stating costs in quantities of labor and material instead of money, applied to mining. 2500 w. Jour Can Min Inst—Vol. XV. No. 42053 N.

MINING

Extracts from Report of S. Price, Limitation of the Hours of Labor of Underground Workmen in the Mines of Ontario. An inquiry into proposed legislation. 6500 w. Can Min Jour—May 1, 1913. No. 41895.

Land Laws

Mineral Land Laws and the Decadence of Prospecting. George W. Riter. Discusses recent changes in the interpretation of the law and its effects. 1500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44068 N.

Mineral Land Laws and the Decadence of Prospecting. George W. Riter. Discusses deplorable features of existing laws and their effect on prospecting. 1500 w. Pro Am Min Cong—1912. No. 46185 N.

The Leasing of Mineral Lands. William Griffith. Opposes the short-term lease, showing it to be unsatisfactory and wasteful, and favoring the long-term lease. 1500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44067 N.

The Leasing of Mineral Lands. William Griffith. A critical discussion of the proposed plan of short tenure leases. 1500 w. Pro Am Min Cong—1912. No. 46184 N.

Laws

Notes on Development of Mining Law. H. C. and L. H. Hoover. History shows that the tendency has been to give the individual wider rights at the expense of the state. The present tendency is to limit the rights of the individual and exalt those of the community. 4000 w. Eng & Min Jour—Nov. 2, 1912. No. 37243.

Mining and the Increased Tax Laws (Der Bergbau und das Reichszuwachststeuergesetz). Herr Berckhoff. Discussion on the present German mining laws. Serial. 1st part. 4300 w. Glückauf—Nov. 9, 1912. No. 38417 D.

The Federal Law and Its Effect on the Miner. Walter W. Bradley. A Discussion of recent rulings. 2500 w. Min & Engng Wld—Jan. 4, 1913. No. 38830.

Recent Mining Legislation and How It Affects Colliery Underground Officials. H. W. Halbaum. Abstract of a lecture discussing recent British legislation. 4000 w. Ir & Coal Trds Rev—Jan. 31, 1913. Serial, 1st part. No. 39819 A.

The Proposed Anthracite Mine Law. Rufus J. Foster. A review and criticism of the act proposed by the sub-committee of the Commission to revise and codify the law. 3000 w. Mines & Min—Feb., 1913. No. 39622 C.

Should the Extralateral Vein Right Be Abolished? L. G. Campbell. From an address delivered before the Nevada Bar

Laws

Assn. Explains the term, extralateral right, its origin, and cause of litigation, discussing whether the law is right in principle. 3500 w. Min & Sci Pr—March 8, 1913. No. 40498.

Mining Laws. Horace V. Winchell. The importance of a liberal mining law is discussed, with reference to the laws of the United States and of Canada, and recommendations. 5500 w. Jour Can Min Inst—Vol. XV. No. 42056 N.

Texan Wool Growers Adopt New Mining Law. W. D. Hornaday. Explains some of the provisions. 2000 w. Min & Engng Wld—May 10, 1913. No. 41974.

The Mining Law of Ontario. Samuel Price. Introductory remarks with review of the history of Ontario law and an outline of the present law. 5500 w. Jour Can Min Inst—Vol. XIV. No. 42033 N.

Mining Rights in Seigniories in the Province of Quebec. T. C. Denis. Explains the provision of reserve of mining rights in seigniories and the state of affairs in Quebec. 1300 w. Jour Can Min Inst—Vol. XIV. No. 42034 N.

Abstract of Current Decisions on Mines and Mining—October, 1912, to March, 1913. J. W. Thompson. A review and abstracts of decisions based on the laws governing the rights and duties of mine owners and persons trafficking in mining properties. 80 pp. Bureau of Mines—Bul. 61. No. 44740 N.

A Dissertation on U. S. Mining Law. Russell L. Dunn. Considers existing U. S. mining statutes and discusses the comparative merits of proposed laws. 8000 w. Min & Engng Wld—Sept. 20, 1913. No. 45265.

Extralateral Rights to Quartz Veins. John B. Clayburg, from *Calif. Law Rev.* A treatment of the law of extralateral rights, embracing all the conditions under which such rights exist, as determined by the court decisions. Ills. 6000 w. Eng & Min Jour—Sept. 20, 1913. No. 45264.

Revision of United States Mining Laws. Report of the Committee of the Min. & Met. Soc. of America. Believes a revision is needed in laws concerning the title or possession of minerals and ores and the lands in which they are found. 3500 w. Min & Sci Pr—Oct. 11, 1913. No. 45907.

Revision of the Mining Law—A Protest. A discussion of the relation of new laws to present laws, efficiency of present laws, rent of mineral rights, and related topics. 3000 w. Min & Sci Pr—Oct. 18, 1913. No. 46152.

Machinery

Investigations on Mining Machinery (Untersuchungen von Bergwerksmas-

MINING

chinen). Tabulated results of tests on ventilating and hoisting machinery. Ills. 2400 w. Glückauf—Aug. 23, 1913. No. 45387 D.

Mechanics of Mining. R. T. Strohm. An explanation of the principles underlying calculations relating to engines, pumps, and other machinery. 1400 w. Col Engr—March, 1913. Serial. 1st part. No. 40280 C.

Management

Examinations for Certificates of Competency Under the Coal Mines Act. Gives questions set at the examination of managers and under-managers of mines. 3500 w. Ir & Coal Trds Rev—June 13, 1913. No. 43169 A.

Maps

Topographic Maps for the Mining Engineer. E. G. Woodruff. Outlines a few of the uncommon relationships which topographic maps and structure-contour maps have to modern methods of mining investigation and development. Ills. 3000 w. Bul Am Inst of Min Engrs—June, 1913. No. 43251 F.

Methods

Mining Methods in the Waihi Mine. Jas. L. Gilmour and W. H. Johnston. Describes the systems used in extracting ore. Ills. 4500 w. Min & Sci Pr—Dec. 21, 1912. No. 38548.

The Wellesley Colliery of the Wemyss Coal Co., Ltd. Jas. D. Welch. Read before the Scottish Fed. Inst. of Min. Students. Drawings and description of methods adopted at a large plant capable of dealing with 4000 tons per day. 2000 w. Ir & Coal Trds Rev—Dec. 13, 1912. No. 38535 A.

Operations of the Davidson Ore Mining Co., Mich. George E. Edwards. Describes equipment and arrangements. A partial use of electric power. 2500 w. Min & Engng Wld—Jan. 11, 1913. No. 39117.

Methods and Costs, Mother Lode Mine, B. C. E. Hibbert. Old systems are abandoned for room and pillar method. Describes wiring system for electric firing and explains advantages of the system. 2000 w. Eng & Min Jour—March 22, 1913. No. 40754.

A Problem in Mining, Together with Some Data on Tunnel Driving. F. M. Simonds and E. Z. Burns. Explains the problem encountered in developing the Rawley property in Colorado, and the solution by tunnel driving, with costs. 9000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40893 F.

A Problem in Mining, Together with Some Data on Tunnel-Driving. Discussion of the paper of F. M. Simonds and

Methods

Microscopy

E. Z. Burns. 3300 w. *Bul Am Inst of Min Engrs*—May, 1913. No. 42465 F.

Proposed Method of Longwall Mining. F. C. Cornet. Describes a method proposed for working the lower Kitanning seam, in the northern part of W. Va. Ills. 2500 w. *Coal Age*—July 26, 1913. No. 43920.

Mining the Wide Ore Bodies at Butte. Claude T. Rice. Describes the practice in the Leonard mine in the Meaderville part of the district, commenting upon the general mining practice. Ills. 3000 w. *Min & Engng Wld*—Aug. 2, 1913. Serial, 1st part. No. 44133.

Factors Affecting Choice of Mining & Method. E. M. Weston. Brief discussion of things to be considered, and available methods of exploration and development. 2500 w. *Eng & Min Jour*—Sept. 20, 1913. No. 45263.

Microscopy

The Use of the Microscope in Mining Engineering. Frederick W. Appgar. Explains the uses to which the microscope may be applied and its value in research work. Ills. 4000 w. *Bul Am Inst of Min Engrs*—June, 1913. No. 43252 F.

Microscopy in Economic Geology. R. Beck. Translation of an address made on the occasion of Prof. Beck's inauguration as rector of the Royal School of Mines at Freiberg, Saxony. Explains the influences of microscopic study on the development of economic geologic theories. 3000 w. *Eng & Min Jour*—May 31, 1913. No. 42641.

Mine Air

Determining the Methane Content in Air Tests by the Aid of a Portable Interferometer (*Die Bestimmung des Methangehaltes der Wetterproben mit Hilfe des tragbaren Interferometers*). E. Küppers. Describes the gas interferometers and explains uses. Ills. 2100 w. *Glückauf*—Jan. 11, 1913. No. 40011 D.

Mine Buildings

The Construction of Mine Buildings Not Liable to Failure (*Über die Durchbildung von Bauten zur Verhütung von Bergschäden*). Herr Elwitz. Discussion and plans for building to resist shocks and strains. Ills. 4900 w. *Glückauf*—Feb. 22, 1913. No. 40514 D.

Mine Calculations

Formulas and Their Use. An explanation of the signs and symbols employed in mining calculations. 1800 w. *Col Engr*—March, 1913. No. 40278 C.

Mine Cars

Mine Slope Economizing Hand Labor. John J. Smith. Describes a single-track mine slope designed to minimize hand

MINING

shifting of cars. Ills. 4000 w. *Eng & Min Jour*—Dec. 21, 1912. No. 38351.

Mine Effects

See same heading, under **CIVIL ENGINEERING, Municipal**.

Mine Examination

The London Mine, Mosquito Mining District, Park County, Colo. Charles J. Moore. Gives result of a recent examination requiring unusual geologic investigation. Describes the topography and geology, ore deposits, etc. Ills. 3500 w. *Bul Am Inst of Min Engrs*—March, 1913. No. 40896 F.

Mine Fires

Mine Fires and How to Fight Them. James W. Paul. Calls attention to methods of preventing fire in a mine and for quickly getting it under control. 4500 w. *U S Bureau of Mines—Miners' Circ*. 10. No. 38671 N.

Mine Fires and Their Prevention. Herbert M. Wilson. Address before the Min. & Fuel Conference, Urbana, Ill. Reviews what has been done toward solving this problem. Ills. 2500 w. *Sci Am Sup*—June 28, 1913. No. 43201.

Mine Lamps

Oil Versus Electric and Spirit Lamps. E. A. Hailwood. Remarks on the safety of different mine lamps, giving results of recent tests. 2500 w. *Ir & Coal Trds Rev*—Nov. 29, 1912. No. 38139 A.

Miners' Electric Lamps. William Maurice. Lecture delivered at the University College, Nottingham. Considers types, the explosion and accident risks, lighting and nystagmus, recent tests, etc. 4000 w. *Ir & Coal Trds Rev*—April 4, 1913. Serial. 1st part. No. 41249 A.

Acetylene Lamps in Mines. R. Cremer. Refers to the types of mine lamps in general use, and reviews the history of acetylene mine lamps. Ills. 4000 w. *Min Jour*—March 22, 1913. Serial. 1st part. No. 41004 A.

The Lighting Efficiency of Safety Lamps. T. A. Saint. Read before the N. of England Inst. of Min. & Mech. Engrs. Report of an investigation of standard patterns. 1200 w. *Ir & Coal Trds Rev*—May 2, 1913. No. 44254 A.

Portable Electric Mine Lamps. H. H. Clark. Discusses the use of such lamps, pointing out certain advantages and suggesting some characteristics that they ought to have. 3000 w. *U S Bureau of Mines—Tech paper* 47. No. 44484 N.

Acetylene Lamps in Coal Mines. Reports tests of carbide lamps, and oil lamps to show their behavior in atmospheres containing carbon dioxide. 1500 w. *Col Engr*—Aug., 1913. No. 44122 C.

Approved Safety Lamps. Gives the

Consult Classification of the Index. See page 9.

Mine Locomotives

conditions specified in the Patterson lamp types. Ills. 2000 w. Col Guard—Aug. 8, 1913. No. 44456 A.

The Use and Care of Miners' Safety Lamps. James W. Paul. Discusses the use and care of common types of miners' safety lamps. Ills. 5000 w. U S Bureau of Mines—Circ. 12. No. 45093 N.

Approved Safety Lamps for Mines. Gives order dated 26th of Aug., 1913, approving certain types of safety lamps for use in mines. Ills. 5000 w. Col Guard—Sept. 12, 1913. Serial, 1st part. No. 45296 A.

Mine Locomotives

Experience on the Road. G. W. Hamilton. Explains how to unload and place a mine locomotive in service. 3000 w. Elec Jour—Dec., 1912. No. 38628.

Experiments on Compressed-Air Tunnel Locomotives (Untersuchung an Tunnel-Druckluftlokomotiven). V. Litz. Describes locomotives and gives tabulated results on the performance of small and large types. Ills. 4900 w. Glückauf—Nov. 9, 1912. No. 38415 D.

The Modern Mine Locomotive. H. K. Hardcastle. Illustrated description of the modern electric mine locomotive. 1600 w. Elec Jour—March, 1913. No. 40873.

Compressed-Air Pit Locomotives. T. Giller. From a paper read before the Ruhr Dist. Sec. of the Soc. of German Engrs. Illustrated description of compressed air mine locomotives, showing progress made. 2500 w. Col Guard—May 23, 1913. No. 42753 A.

Internal Combustion Mine Locomotives. John Tyssowski. Illustrates and describes features of construction of the principal American-made gasoline locomotives. 2500 w. Eng & Min Jour—Aug. 23, 1913. No. 44552.

The Storage Battery Locomotive. Arvid R. Anderson. Considers its application for mine haulage, and the method of calculating the size of locomotive and battery needed. Ills. 3500 w. Col Engr—Oct., 1913. No. 45639 C.

Gasoline Mine Locomotives. Carl Scholz. Reports satisfactory use for mine haulage. 1500 w. Col Engr—Oct., 1913. No. 45641 C.

Gasoline Motors in Coal Mines. A. J. King. Discusses the conditions under which they may be used and the extent to which they vitiate the air. Ills. 1000 w. Col Engr—Oct., 1913. No. 45645 C.

See also Locomotives (Electric), under RAILWAY ENGINEERING, *Motive Power and Equipment*.

Mine Motor

The History of the Gasoline Mine Motor. R. O. Hodges. Describes early at-

MINING

tempts to meet the requirements. 2500 w. Coal Age—July 19, 1913. Serial, 1st part. No. 43813.

Mine Power

The Development of Mechanical Power in the Mines of the Northeastern Coalfield: A Comparison and a Contrast. Robert Nelson. Read before the Assn. of Min. Elec. Engrs. Reviews the important part mechanical power has played, considering its use in the 18th, 19th and present centuries. 5500 w. Ir & Coal Trds Rev—Feb. 21, 1913. No. 40320 A.

A Note on the Comparative Efficiencies of Compressed Air versus Hydraulic Power for Mining Operations. G. A. Denny. 4000 w. Can Min Jour—May 15, 1913. No. 42347.

The Production, Transmission and Application of Power at Collieries in Scotland. W. H. Telfer. Read before the Nat. Assn. of Col. Mgrs. and the Assn. of Min. Elec. Engrs. Considers various sources of power and methods of power transmission. 5500 w. Ir & Coal Trds Rev—May 23, 1913. No. 42761 A.

See also Electric Power, under *Mining*.

Mine Pumps

Some Novel Devices in Connection with Electrical Pumping Installations in Mines. R. Herzfeld. From a paper read before the Midland Inst. of Min., Civ., & Mech. Engrs. Describes features of an installation at the Dover Collieries. Ills. 2000 w. Col Guard—Jan. 31, 1913. No. 39792 A.

Some Novel Devices in Connection with Electrical Pumping Installations in Mines. R. Herzfeld. Abstract of paper read before the Inst. of Min. Engrs. A description of the electrical pumping plant installed at the Dover Collieries. 1200 w. Elect'n, Lond—Feb. 28, 1913. No. 40468 A.

Power Supply on the Rand. A. E. Hadley. Particulars are given of the Victoria Falls and Transvaal Power Co. and of the history of electric power supply on the Rand. Ills. 10800 w. Inst of Elec Engrs—March, 1913. No. 40807 N.

See also Electric Power, under *Mining*.

Miners' Baths

Baths for Miners. Gives the text of the new draft Regulations, and the report of the Departmental Committee. Ills. 5500 w. Col Guard—May 16, 1913. No. 42535 A.

Baths for Miners. William Walker. Notes on the character, accommodations and facilities provided in Westphalia, Belgium, and France. 3500 w. Ir & Coal Trds Rev—July 11, 1913. No. 43906 A.

Mine Switches

Mine Switches

Safety Electric Switches for Mines. H. H. Clark. A study of the various means and methods used to confine the flashes that occur when such switches are operated. A brief review of the test results. 1500 w. US Bureau of Mines—Tech paper 44. No. 43760 N.

Mine Ties

The Use of Steel Ties in Mining. J. Clark Evans. Read before the W. Va. Coal Min. Inst. Summarizes the many advantages of steel mine ties. 2500 w. Coal Age—July 5, 1913. No. 43444.

Mine Waters

Mine Waters. A. C. Lane. Excerpt from the report to the Board of Geol. & Biol. Survey, Mich., 1909. Gives a summary of results of a study of the Lake Superior mine waters. 2000 w. Min & Sci Pr—Nov. 9, 1912. No. 37559.

Mining Bureau

The California State Mining Bureau. William H. Storms. Read before the Cal. Miners' Assn. An account of the creation of this State Mining Bureau, explaining its purpose. 3000 w. Min & Sci Pr—Dec. 28, 1912. No. 38764.

Mining Hazards

The Relative Hazard of All Vocations in Comparison with Mining. Hywel Davies. A plea for reliable statistics in all industries in regard to the loss of life on accidents. 3600 w. Pro Am Min Cong—1912. No. 46179 N.

Mining Plants

Installing a Mining Plant in Latin America. Edward W. Perry. An illustrated record of the troubles encountered. 2500 w. Engineering Magazine—Feb., 1913. No. 39428 B.

The Shaft Plants 8 and 9 of the Constantine the Great Mines (Die Schachtanlage VIII/IX der Zeche Constantin der Grosse). Herrn Illgen and Wollenweber. Plans and description of new electrical equipment for these mines near Bochum, Germany. Ills. Serial. 1st part. 6000 w. Glückauf—May 24, 1913. No. 43-008 D.

Nationalization

The Nationalization of Mines. Presents facts and considerations bearing upon State ownership of mines. 1000 w. Engr, Lond—May 9, 1913. No. 42292 A.

Ore Deposits

The Nature of Replacement. Waldemar Lindgren. Gives a summary of previous views, examines classes of replacement, porosity, crystallization, etc. 5000 w. Ec-Geol—Sept., 1912. No. 37668 D.

Persistence of Ore Deposits in Depth. Horace V. Winchell. Discusses conditions

MINING

Pumping

of ore deposition, precipitation, and the relation of depth to value. 2500 w. Min & Sci Pr—Aug. 30, 1913. No. 44947.

The Influence of Depth on the Character of Metalliferous Deposits. J. F. Kemp. Read before the Int. Geol. Congr. A summary of what has been learned with regard to the values of ores with increasing depth. 3000 w. Can Min Jour—Sept. 1, 1913. No. 44866.

Primary and Secondary Ores Considered With Especial Reference to the Gel and the Rich Heavy Metal Ores. P. Krusch. Read before the Int. Geol. Cong. Gives results of work at the Inst. of Ore Deposits, in Berlin. 6000 w. Min & Sci Pr—Sept. 13, 1913. No. 45242.

Influence of Flat Dike on Ore Formation. E. A. Colburn, Jr. Describes a rather unusual occurrence at Cripple Creek. 1200 w. Eng & Min Jour—Sept. 27, 1913. No. 45498.

Pipe Lines

Heavy-Duty Pipe Lines of Small Diameter. A. D. Akin. Detailed description of proper methods to be employed. 1500 w. Min & Engng Wld—April 12, 1913. Serial. 1st part. No. 41200.

Props

Props and Beams in Mines. S. M. Dixon. From a paper read before the Concrete Inst. Discusses substitutes for timber, especially reinforced concrete, reporting tests. 2500 w. Col Guard—April 4, 1913. No. 41235 A.

Prospecting

The Treasury Tunnel Raise. H. Y. Russel. Describes work near Red Mountain, Colo., where a tunnel was driven in the vein for prospecting, but was subsequently to be trimmed and serve as a shaft. 3000 w. Eng & Min Jour—Dec. 14, 1912. No. 38194.

A Microscopist in the Field. Walter E. Koch. On the use of a simple form of microscope for studying minerals in place, explaining its value. 2500 w. Eng & Min Jour—Jan. 18, 1913. No. 39221.

Application of Genetic Theories to the Search for Ore. George E. Collins. Extract from presidential address before the Colo. Sci. Soc. Discusses the study of ore deposits, the importance of records, etc. 3000 w. Can Min Jour—Aug. 1, 1913. No. 44205.

Applied Geology, Michigan Iron Ranges. P. B. McDonald. Describes illustrated examples of successful and unsuccessful diamond drilling. 2000 w. Eng & Min Jour—Aug. 2, 1913. No. 44130.

Pumping

Difficulties of Pumping on the Comstock Lode. Whitman Symmes. Describes

Quarry Accidents

types of pumps in use and the work they are required to perform. 4000 w. *Min & Engng Wld*—Jan. 11, 1913. No. 39116.

Quarry Accidents

Quarry Accidents in the United States During the Calendar Year 1911. Albert H. Fay. Accident statistics with 23 tables. 500 w. U S Bureau of Mines—Tech Paper 46. No. 42448 N.

Quarrying

Mining by Wholesale. Thomas T. Reed. Illustrated description of the quarry and crushing plant at Tomkins Cove, N. Y. 4000 w. *Min & Sci Pr*—Sept. 6, 1913. No. 45065.

Rescue Apparatus

The New Westphalia Rescue Apparatus, Model 1912 (Der neue Westfalia-Rettungsapparat, Modell 1912). Herr Breyhan. Detailed description of new helmet, breathing apparatus and oxygen generators. Ills. 3000 w. *Glückauf*—Feb. 22, 1913. No. 40513 D.

Improvements in Oxygen Breathing Apparatus and Their Tests (Neuerungen auf dem Gebiet der Sauerstoff-Atmungsgeräte und damit angestellte Versuche). Herr Grahn. Details of the latest models of Dräger, Westphalian and Fleus pulmotors. Ills. 2200 w. *Glückauf*—Sept. 27, 1913. No. 46008 D.

Oxygen Breathing Apparatus with and Without Injectors (Ueber Sauerstoff-Atmungsgeräte mit und ohne Injektoren).

Herr Forstmann. Describing action of pulmotors of both types. Ills. 2000 w. *Glückauf*—Sept. 27, 1913. No. 46007 D.

Rescue Appliances

Mine Rescue Appliances: A Danger Occurring in the Use of an Apparatus in Which an Injector is Employed. John Cadman. From an address before the S. Staffordshire and Warwickshire Inst. of Min. Engrs. Also discussion. 3000 w. *Ir & Coal Trds Rev*—Dec. 20, 1912. No. 38906 A.

Training with Mine-Rescue Breathing Apparatus. James W. Paul. Explains the methods of training recommended by the Bureau of Mines. 2500 w. U S Bureau of Mines—Tech. paper 29. No. 39506 N.

The Pulmotor in Mine Rescue Work. Henry E. Bertling. Describes this automatic resuscitation apparatus. 1500 w. *Can Min Jour*—May 1, 1913. No. 41894.

Resuscitation Appliances for Mine Rescue Service (Wiederbelebungsvorrichtungen für den Grubenrettungsdienst). Herr Breyhan. Describes several appliances for life saving work, and their operation. Ills. Serial. 1st part. 4500 w. *Glückauf*—April 26, 1913. No. 42118 D.

MINING**Rescue Work**

Method of Testing Draeger Oxygen Helmets at the Copper Queen Mine. C. A. Mitke. The gases causing failure of the helmets; test methods first tried, and final successful test methods used. Ills. 1000 w. *Bul Am Inst Min Engrs*—July, 1913. No. 44009 F.

Testing Appliances for Oxygen Breathing Apparatus (Prüfungsvorrichtungen für Sauerstoff-Atmungsgeräte). Dr. Forstmann. The design and operation of several devices for determining the efficiency of different rescue apparatus. Ills. 1700 w. *Glückauf*—Aug. 2, 1913. No. 44620 D.

Rescue Work

Mine Rescue Work in Canada. W. J. Dick. An account by provinces of the nature and extent of the mine-rescue work. 3000 w. *Can Min Jour*—Feb. 1, 1913. No. 39659.

The Organization of the Mine Rescue Service at the Imperial Mine Directory at Brüx in Northwest Bohemia and the Central Rescue Station at the Imperial Mine Julius III (Die Organisation des Grubenrettungsdienstes bei der K. K. Bergdirektion Brüx in Nordwestböhmen und die Zentral-Rettungsstation am K. K. Schachte Julius III). Gustav Ryba. The staff, outfit and station equipment at each place. Ills. Serial, 1st part. 2000 w. *Oest Zeit f Berg u Hütten*—Sept. 6, 1913. No. 45374 D.

Breathing Devices in Rescue Work in the Mines of Austria (Die Atmungsapparate im Rettungswesen beim österreichischen Bergbau). Wilhelm Pokorný. The rescue stations throughout Austrian mining districts and their work, and descriptions of the Draeger, Westphalia, Pneumatogen and Aerolith appliances, especially the two latter. Serial, 1st part. 4400 w. *Oest Zeit f Berg u Hütten*—Sept. 6, 1913. No. 45373 D.

First-Aid Instructions for Miners. M. W. Glasgow, W. A. Raudenbush and C. O. Roberts. A circular intended to serve as a guide to miners in rendering aid to injured workmen. Ills. 66 pp. U S Bureau of Mines—Miners' Circ 8. No. 46107 N.

Safety Provisions of Victor-American Fuel Co. F. W. Whiteside. Illustrates and describes precautions taken to prevent accidents. 1500 w. *Coal Age*—Oct. 11, 1913. No. 45784.

Organization and Management of the Mine Rescue Work in the District of the Third Section of the Co-operative Laborers' Societies at Clausthal in 1912 (Die Entwicklung und Handhabung des Grubenrettungswesens im Bezirk der Sektion 3 der knappschaffts-Berufsgenossen-

Consult Classification of the Index. See page 9.

Roofing

schaft zu Clausthal im Jahre 1912). Herr Breyhan. Plan and description of rescue station and training. Ills. 4800 w. Glückauf—Sept. 20, 1913. No. 46005 D.

Roofing

Reinforced Concrete for Roofing a Level. W. Fischer Wilkinson. Illustrated account of the use of concrete in mines, giving cost for work described. Ills. 2000 w. Mining Mag—Dec., 1912. No. 38637 B.

Safety Appliances

System of Safety at the Cleveland-Cliffs Properties. William Conibear. Abstract of a paper read before the L. Superior Min. Inst. An account of the work of the Safety Inspection Department. 2000 w. Min & Engng Wld—Nov. 9, 1912. No. 37345.

Safety Catches for Mine Cages. J. A. Vaughan. Facts and opinions in regard to their use. 7500 w. S African Min Jour—Sept., 1912. (Special.) No. 37862 N.

Safety Devices

The Grunewald Safety Attachment for Winding Engines. Dr. Ing. Förster, in *Zeit. des Ver. Deut. Ing.* Illustrated description of the device and its operation. 1000 w. Ir & Coal Trds Rev—Nov. 22, 1912. No. 38038 A.

An Accident with Breathing Apparatus. (Ein Unfall mit Atmungsgeräten). Herr Forstmann. Details of a peculiar serious accident to a pulmotor while in service. 1800 w. Glückauf—April 5, 1913. No. 41420 D.

See Explosions, under *Coal and Coke*.

Safety Lamps

Approved Safety Lamps. Gives the schedule describing the types of safety lamp and safety-lamp glass approved until further order. Ills. 1000 w. Col Guard—March 14, 1913. No. 40820 A.

The Heating of Safety Lamp Gauges in Fiery Atmospheres. From a report by Emmanuel Lemaire in the *Ann. des Mines de Belgique*, recording the results of experiments at the Frameries testing station. 2500 w. Col Guard—March 14, 1913. No. 40819 A.

Sampling

See Drilling, under *Mining*.

Sanitation

Sanitary Conditions in Mining Camps. Charles H. Hair. Suggests the best methods for ensuring sanitary conditions. 1300 w. Jour Can Min Inst—Vol XV. No. 42060 N.

Sanitation for Mine Locations. W. H. Moulton. Considers means of guarding the health of miners by sanitary work. 2000 w. L Superior Min Inst—Aug. 26, 1913. No. 44587 N.

MINING

Shafts

Concrete Shaft Station, Wolverine Mine. Claude T. Rice. Detailed description of concreting methods in a Michigan copper mine inclined shaft station. Ills. 1500 w. Eng & Min Jour—Aug. 30, 1913. No. 44889.

Safety Gates for Shafts. Brief illustrated description of automatic gate locking and operating devices for protection against accidents. 800 w. Col Engr—Oct., 1913. No. 45644 C.

Relining No. 2 Hamilton Shaft. Illustrated description of replacing timbering by concrete. 1800 w. Eng & Min Jour—Oct. 11, 1913. No. 45804.

Shaft-Sinking

The Stockfish System of Shaft-Sinking at the Diergardt Colliery. Herr Krecke. Plans and description of this system which requires no lining until the shaft is finished. 1200 w. Col Guard—Nov. 1, 1912. No. 37396 A.

Method and Cost of Constructing a Concrete Lined Shaft by Sinking Through Overburden and Enlarging a Drift Raised Through Ledge Rock. Drawings and descriptions of work at the Negaunee mine, Michigan. 3000 w. Engng & Con—Jan. 22, 1913. No. 39328.

Shaft Sinking at the Indiana Mine. Claude T. Rice. A concrete-lined caisson or drop-shaft was sunk through 100 ft. of sandy overburden. Ills. 2000 w. Engng & Min Jour—March 8, 1913. No. 40365.

Sinking the Hancock No. 2 shaft. Claude T. Rice. An illustrated account of the sinking of the second largest vertical shaft in the Lake Superior copper country. 3000 w. Eng & Min Jour—April 19, 1913. No. 41343.

Sinking a Concrete Shaft Lining Through Quicksand. Describes a difficult operation carried out by a combination of the open-dredging and pneumatic-caisson processes. Ills. 1700 w. Eng Rec—April 5, 1913. No. 41121.

Results of Shaft Tubbing Experiments (Erfolge mit dem Senkschachtverfahren). C. Beil. A review of tubbing methods employed experimentally, with costs, including sinking shoe, concrete lining, etc. Ills. 3500 w. Glückauf—March 4, 1913. No. 41412 D.

Rand Practice in Deep Shaft Sinking. Charles B. Brodigan. Lecture at Roy. Sch. of Mines, London. Considers the Problem of the Brakpan Mines, describing the equipment for sinking the work, etc. 4500 w. Min & Sci Pr—April 26, 1913. Serial. 1st part. No. 41806.

Notes on Sinking Operations at the Springs Mines, Transvaal. B. D. Bushell. Describes new features in sinking

Consult Classification of the Index. See page 9.

Signalling

through water-bearing strata. Ills. 1800 w. Inst of Min & Met, Bul 104—May 15, 1913. No. 43157 N.

Sinking Against Water on the Rand. Describes process of sinking a seven-compartment shaft on the Rand against a water flow of about 1300 gal. per minute. 1500 w. Eng & Min Jour—June 14, 1913. No. 42834.

Shaft-Sinking Methods of Butte. Norman B. Braly. Describes the present practice of shaft sinking in the Butte district. Ills. 4500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44754 F.

Sinking a Circular Shaft. E. Mackay Heriot. Discusses the cost and speed of sinking, the surface plant, and the methods of placing masonry and concrete linings. Ills. 3500 w. Eng & Min Jour—Feb. 8, 1913. Serial, 1st part. No. 39739.

Signalling

Notes on Shaft Signalling with Special Reference to the Nodon Rectifier. T. Charlton. Read before the Assn. of Min. Elec. Engrs., Yorkshire Branch. Remarks on signals in use, with description of the rectifier. Diagrams. 2500 w. Ir & Coal Trds Rev—Nov. 8, 1912. No. 37654 A.

Shaft-Signalling Devices Operated from the Moving Cage. J. Kersten, in *Ann. des Mines de Belgique*. Illustrates and describes electrical, mechanical, and combined devices used in the Ostrau-Karwin district. 2000 w. Col Guard—Aug. 22, 1913. No. 44916 A.

Signals

Notes on Signals, Bells and Batteries. W. A. Heyes. Read before the Nat. Assn. of Col. Mgrs. Deals with the installation and upkeep of electric signalling systems at collieries. Discussion. 3500 w. Ir & Coal Trds Rev—May 9, 1913. No. 42299 A.

Signal Systems

Bell and Lamp Signal Systems. Sydney F. Walker. Discusses the difficulties encountered in mine signals. Ills. 1200 w. Elec Wld—Jan. 18, 1913. Serial. 1st part. No. 39231.

South Africa

Electrical Distribution for Mines. J. W. Anson. Abstract of a paper read before the S. African Inst. of Elec. Engrs. Describes the conditions likely to be met with upon installing electrical plant in the S. African Mines, and advises on the class of plant best able to meet the conditions. 2500 w. Elect'n, Lond—June 27, 1913. No. 43624 A.

Stoping

High Stopping with the Aid of Mine Haulage Machinery (Abbau mit hohem

MINING

Stoss unter Verwendung von Abbaufördereinrichtungen). Dipl.-Bergingenieur von Bolesta-Malewski. Shows the dangers attending ordinary high stoping, and describes arrangement of using cutting machinery. Ills. Serial. 1st part. 5000 w. Glückauf—Oct. 26, 1912. No. 37417 D.

Open Stopping on Wide Lodes (South Mine Practice). Andrew Fairweather. Describes the stoping system. Abstract of paper and discussion before the Broken Hill Congress. 3500 w. Aust Min Stand—June 19, 1913. No. 43885 B.

Stoping Methods in Michigan Mines. P. B. McDonald. Illustrates and describes new methods aiming to do away with the use of so much timber and to make mining safer. 2500 w. Min & Sci Pr—July 5, 1913. No. 43604.

Underhand Stopping with Square Sets as Practiced in the Broken Hill Proprietary Mine. J. C. Coldham. Describes the latest method put into practice at Broken Hill to meet the requirements for mining broken and badly supported ground. 3000 w. Aust Min Stand—June 19, 1913. No. 43886 B.

Stowing

The Relation Between Subsidence and Packing, with Special Reference to the Hydraulic Stowing of Goaves. George Knox. Abstract of paper read before the Manchester Geol. & Min. Soc. Illustrated discussion of accidents due to subsidence, the difficulties of hydraulic packing, and related subjects. 3500 w. Ir & Coal Trds Rev—Dec. 13, 1912. No. 38534 A.

Surveying

Difficulties in Mine Surveying. H. G. Henderson. Describes methods of overcoming difficulties. Ills. 1200 w. Mines & Min—Feb., 1913. No. 39624 C.

Mine Surveying. E. A. Colburn, Jr. Shows losses due to poor survey work and suggestions for accurate surveys. 1500 w. Min & Sci Pr—Feb. 15, 1913. No. 39966.

The Use of Relief Maps in Mine Surveying. H. G. Henderson. Describes methods of constructing map models. Ills. 2500 w. Sci Am Sup—Feb. 15, 1913. No. 39887.

Switches

Underground Mine Switches. D. W. Jessup. Describes and discusses types of switches employed. Ills. 2200 w. Eng & Min Jour—Nov. 30, 1912. No. 37960.

Taxation

The Taxation of Mines in Various Countries. David Bowen. From a paper read before the Midland Inst. of Min., Civ., & Mech. Engrs. Briefly considers common law taxes, special taxes, local

Consult Classification of the Index. See page 9.

Timbering

taxes and compulsory insurance. 4000 w. Col Guard—Jan. 31, 1913. No. 39794 A.

Timbering

Mine Supports in Germany. Illustrates and describes various forms of timber, steel and concrete supports, use of rails, pipe and flat iron. 1800 w. Mines & Min—Dec., 1912. No. 38002 C.

Square-Set Timbering: Importance and Evolution. Claude T. Rice. An account of the gradual development of square-set-timbering. Ills. 4000 w. Min & Engng Wld—Dec. 14, 1912. Serial. 1st part. No. 38208.

Timber-Framing Mills for Square-Set Mines. Claude T. Rice. Illustrates and describes the framing mills and framing machines and power requirements. 3000 w. Min & Engng Wld—Feb. 1, 1913. Serial, 1st part. No. 39639.

Timber Framing Mills in the Butte District, Mont. Claude T. Rice. Deals particularly with the equipment and capacity, especially exemplified by Butte practice, adapted to shaping round timbers. Ills. 2500 w. Min & Engng Wld—Feb. 22, 1913. No. 39986.

Framing Shaft Timber Sets by Machinery. Claude T. Rice. Describes the system used at the West Steward Mine, Butte, Mont. Ills. 4000 w. Min & Engng Wld—July 12, 1913. No. 43685.

Shaft Timbering in Butte Copper Mines. Claude T. Rice. Gives details of the different framings used. 7000 w. Min & Engng Wld—Oct. 18, 1913. No. 45949.

Safe Timbering. Illustrates and describes examples of systematic placing of timbers. 1500 w. Col Engr—May, 1913. No. 41833 C.

Timber Recovery in Square-Set Mines. Clarence L. Larson. Illustrates and describes methods of recovery, giving costs. 1000 w. Min & Engng Wld—May 24, 1913. No. 42393.

Timbering in the Butte Mines. B. H. Dunshee. A short description of the different kinds of framing that have been used, and what has been decided upon after years of experience. Ills. 2500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44749 F.

Tunnels

No. 5 Tunnel, Mammoth Mine, Calif. Robert E. Hanley. Illustrated description of a tunnel driven below existing workings to facilitate ore transportation and to provide drainage. 2500 w. Eng & Min Jour—Dec. 21, 1912. No. 38352.

Unwatering

Unwatering two Notable Excavations. Brief account of methods employed in sinking a shaft on the Catskill Aqueduct

MINING

and in driving tunnels under the East River, New York. Ills. 2000 w. Col Engr—April, 1913. No. 40973 C.

Bailing Through an Untimbered Shaft. Douglas Muir. Detailed description of the methods used in unwatering the Rayas mine at Guanajuato, Mex. Ills. 2500 w. Eng & Min Jour—May 17, 1913. No. 42230.

Valuation

Taxation Value of Mineral Rights. Alfred C. Lane. Discusses the value of mineral rights, and how estimated. 2500 w. Eng & Min Jour—Nov. 9, 1912. No. 37367.

Ore Valuation. G. A. Denny. Notes and observations indicating in what circumstances the methods usually employed on the Rand may cause over-valuation 3000 w. S African Mining Jour—Sept., 1912. (Special.) No. 37842 N.

Principles of Mine Valuation. James R. Finlay. Considers some of the fundamental factors which determine value. 3500 w. Sch of Mines Qr—Jan., 1913. No. 40758 D.

Valuation of Iron Mines. James R. Finlay. Discusses the vital factors for any iron-ore field, and how the Lake mines meet the requirements. 5000 w. But Am Inst of Min Engrs—March, 1913. No. 40903 F.

Valuation of Iron-Mines. Discussor of the paper of James R. Finlay. 8500 w. Bul Am Inst of Min Engrs—May, 1913. No. 42466 F.

The Valuation of Mines. T. A. Rickard. Explains the difficulties and the points necessary to ascertain to appraise a mine. 6000 w. Min & Sci Pr—May 24, 1913. No. 42509.

Ventilation

The Ventilation of Rand Mines. Reviews what has been done to improve the ventilation. Ills. 1200 w. S African Jour—Sept., 1912. (Special.) No. 37840 N.

Researches on Mine Ventilation by Means of Air-Pipes (Untersuchungen über Wetterführung mittels Lutten). Willy Arlt. Comprehensive series of experiments on various systems. Ills. Serial. 1st part. 4400 w. Zeitschr des Ver deutscher Ing—Sept. 28, 1912. No. 37443 D.

Ventilation Standard and Test at Metal Mines. Frank Reed. Abstract of a paper read before the Australasian Inst of Min Engrs. Reviews the standards of ventilation in operation, investigations, and laws appertaining to mine ventilation. 3000 w. Min & Engng Wld—Feb. 15, 1913. No. 39869.

Ventilation in Metal Mines. Frank C. Loring. Brief discussion of conditions

Consult Classification of the Index. See page 9.

Ventilation

and the need of proper ventilation. 1200 w. Jour Can Min Inst—Vol. XV. No. 42061 N.

Mine Ventilation. This first article of a series deals with the quantity of air, mine laws and their requirements. 800 w. Col Engr—June, 1913. Serial. 1st part. No. 42612 C.

Different Types of Ventilation Indicators (Die verschiedenen Bauarten von Wetteranzeigern). Dr. Forstmann. An account of the various apparatus in use for the detection of insufficient ventilation in mines. Ills. Serial, 1st part. 6300 w. Glückauf—June 28, 1913. No. 44614 D.

Ventilating Mines and Removing Gas. Dr. J. J. Rutledge. Considers methods of handling air-currents and precautions suggested by experience and observation. 6500 w. Col Engr—Sept., 1913. No. 44850 C.

Tests with Compressed-Air Jet Apparatus and Ventilators in Special Ventilation (Versuche mit Druckluftstrahlapparaten und Ventilatoren zur Sonderbewetterung). O. Döbelstein. Tabulated results of tests with jet, electric and turbo-ventilators. Ills. 3500 w. Glückauf—Sept. 27, 1913. No. 46006 D.

See also Air Control, under *Mining*; Testing Stations, under *Coal and Coke*, and A. C. Motors, under *ELECTRICAL ENGINEERING, Dynamos and Motors*.

Wages

See same heading under **INDUSTRIAL ECONOMY**.

MINOR MINERALS**Winding**

The "Bayley" Overwind Preventer. States the essentials of an ideal overwinding preventer, and describes the "Bayley" gear, which is entirely unlike any other in main principles. Ills. 1200 w. Col Guard—May 9, 1913. No. 42284 A.

The Bennett Duplex Vertical Overwinding Controller. Drawings and description of this device designed to promote safety of winding operations. 1500 w. Col Guard—Aug. 29, 1913. No. 45039 A.

Winding Engines

The Braking of High-Speed Winding Engines. G. K. Chambers. Read before the S. African Inst. of Engrs. Deals particularly with problems of braking of electric winders, but discusses mechanical braking in general. Ills. 5500 w. Col Guard—Jan. 17, 1913. No. 39472 A.

Winding Engine Controllers. James Black. Read before the Scottish Branch of the Nat. Assn. of Col. Mgrs. Discusses debated points in regard to the control, and reports tests made on the Rosehall controller. Discussion. Ills. 2500 w. Ir & Coal Trds Rev—Jan. 17, 1913. No. 39491 A.

Operation of Steam Winding Engines (Manoeuvre des machines d'extraction à vapeur). P. Drosne. A comparative study of double-compound tandem winding engines. Ills. 4500 w. Tech Mod—Jan. 1, 1913. No. 39072 D.

MINOR MINERALS**Alumina**

Symposium of Papers on Alumina. Four papers on the production and uses of alumina, by J. W. Richards, S. A. Tucker, A. H. Cowles, and L. E. Saunders. 9800 w. Met & Chem Engrg—March, 1913. No. 40331 C.

Aluminum Works

The Vigeland Aluminum Works at Vennesla, Norway (Die Aluminium-Werke Vigeland bei Vennesla in Norwegen). G. Wüthrich. Reviews the Norway aluminum industry, the production of this plant and its water-power development. Ills. Serial, 1st part. 1800 w. Schweiz Bau—Jan. 4, 1913. No. 40026 D.

Amber

Extraction and Working of Amber in Palmnicken (Gerrinnung und Verarbeitung von Bernstein in Palmnicken). E. Bellmann. Amber mining on the shores of the Baltic in East Prussia; its appearance in the raw form, and the work of

cutting and shaping. Ills. 4200 w. Glückauf—June 14, 1913. No. 43513 D.

Asbestos

Asbestos. J. F. Springer. Illustrated account of its production and industrial applications. 3500 w. Cassier's Mag—Oct., 1912. No. 37153 B.

Asbestos History. W. J. Woolsey. Reviews the chief features in the development of the asbestos industry. 1500 w. Can Min Jour—Nov. 1, 1912. No. 37278.

The Asbestos Deposit at Soanesville, Pilbara Goldfield. Torrington Blachford. Abstract from an official report describing deposits in Australia. 1600 w. Min Jour—Nov. 30, 1912. No. 38118 A.

The Asbestos Deposits of the New England States. C. H. Richardson. Considers the Geology, origin, uses, etc. Ills. Discussion. 9500 w. Jour Can Min Inst—Vol. XIV. No. 42022 N.

The Breaking of Asbestos-Bearing Rock. Edward Torrey. Discusses the

Consult Classification of the Index. See page 9.

Asbestos

Asphalt

rock-breaking machines used in asbestos milling. Discussion. 3500 w. Jour Can Min Inst—Vol. XIV. No. 42023 N.

The Types and Modes of Occurrence of Asbestos in the United States. J. S. Diller. Description and general information. 4000 w. Jour Can Min Inst—Vol. XIV. No. 42021 N.

Asbestos Mining in Quebec. Reginald E. Hore. Information concerning the deposits, method of mining, production, etc. 700 w. Can Min Jour—Oct. 15, 1913. No. 45992.

Asbestos Mining in Quebec in 1912. Theo C. Denis. Extracts from a recent report. Ills. 1500 w. Can Min Jour—Oct. 1, 1913. No. 45693.

Development of the Asbestos Mining Industry in Quebec. Fritz Cirkel. Reviews the known history of asbestos and its uses, giving information concerning the Quebec deposits. 2500 w. Can Min Jour—Oct. 15, 1913. No. 45993.

Asphalt

Rock Asphalt-Deposits of Oklahoma. L. C. Snider. Map showing location, with description of deposits. Ills. 1700 w. Min & Engng Wld—March 22, 1913. No. 40772.

See same heading, under CIVIL ENGINEERING, *Materials of Construction*.

Bauxite

Mining of Bauxite (Aluminum Ore) Monopolized by the South. W. C. Phalen. Information concerning the production, uses, methods of mining, etc. Ills. 3000 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41561 N.

Bauxite and the Electric Furnace (La Bauxite et le four électrique). Georges Flusin. The production of artificial corundum, pure aluminum and its alloys, aluminum nitrate, etc., by this process. 4000 w. Bull Soc Int d'Électriciens—June, 1913. No. 43569 F.

Bismuth

Bismuth: Its Properties and the Sources of Supply. T. H. Osborne. Information concerning the localities where it is found, its refining, etc. 2500 w. Chem Engr—April, 1913. No. 41826 C.

Bitumens

Characteristics and Differentiation of Native Bitumens and Their Residuals. Clifford Richardson. A study based on percentages of various constituents and their method of occurrence. 3500 w. Eng Rec—April 26, 1913. No. 41540.

Canada

The Production of Cement, Lime, Clay Products, Stone, and Other Structural Materials in Canada During the Calendar Year 1911. John McLeish. Advance chapter of the annual report on the min-

MINOR MINERALS**Dolomites**

eral production of Canada. 16000 w. Can Dept of Mines—No. 181. No. 39538 N.

Clays and Clay Industries of Canada. J. Keele. Reviews what is known of the clay and shale resources of Canada and their uses. Ills. 3000 w. Ap Sci—Dec., 1912. No. 39308 C.

Carbonaceous Deposit

A Remarkable Carbonaceous Deposit Near Putnam, New Mexico. William Foster. Describes the deposit, its occurrence, analysis, solubility, test, etc. 2500 w. Ec-Geol—June, 1913. No. 42950 D.

Cement

See same heading, under CIVIL ENGINEERING, *Materials of Construction*.

China Clay

China Clay Production in Devon and Cornwall, England. W. S. Harvey. Information concerning details of this industry. 1200 w. Can Engr—Nov. 21, 1912. No. 37776.

Clays

Clay Products and Clays of the South. Jefferson Middleton. The outlook for the industry, with a résumé by states of the clay resources. 4000 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41562 N.

Dehydration of Clays. G. H. Brown and E. T. Montgomery. A study undertaken for the purpose of comparing a number of typical American clays as regards certain relations. 23 pp. U S Bureau of Stand—Tech paper No. 21. April 25, 1913. No. 44507 N.

The Function of Time in the Vitrification of Clays. G. H. Brown and G. A. Murray. Describes investigations and discusses results. Ills. 4000 w. U S Bureau of Stand, No. 17—May 20, 1913. No. 45548 N.

Effect of Over Firing Upon the Structure of Clays. A. V. Bleining and E. T. Montgomery. Describes experimental work, discussing results. 3000 w. U S Bureau of Stand, No. 22—May 15, 1913. No. 45549 N.

Technical Control of the Colloidal Matter of Clays. H. E. Ashley. A report of investigations and a study of applications. Ills. 115 pp. U S Bureau of Stand, No. 23—Nov., 1911. No. 45550 N.

Corundum

An Assay for Corundum by Mechanical Analysis. W. Spencer Hutchinson. Describes briefly a method used to determine the corundum contents of samples of hard crystalline gneiss containing both corundum and red garnet. 700 w. Bul Am Inst of Min Engrs—June, 1913. No. 43255 F.

Dolomites

The Character and Possible Origin of

Consult Classification of the Index. See page 9.

Electrometallurgy

the Green Dolomites of New Ontario. N. B. Davis. Report of investigations made by the writer. Ills. 2500 w. Jour Can Min Inst—Vol. XIV. No. 42036 N.

Electrometallurgy

The Electrodeposition of Tin. Edward F. Kern. Read before the Am. Electro-Chem. Soc. A compilation of data collected from available sources. 9000 w. Chem Engr—June, 1913. No. 43164 C.

Feldspar

Mining and Treatment of Feldspar and Kaolin in the Southern Appalachian Region. A. S. Watts. Report of investigations showing the United States will be able to supply all of the Kaolin required for domestic consumption, and of quality excelled by none. Ills. 164 pp. U S Bureau of Mines Bul 53. No. 45160 N.

Fire-Clay

Fire-Clay Deposits of Canada. Heinrich Ries. Describes deposits in Nova Scotia, Saskatchewan, and British Columbia. Ills. 3000 w. Bul Am Inst of Min Engrs—March, 1913. No. 40897 F.

Garnet

Notes on Garnet Zones on the Contact of Intrusive Rocks and Limestones. J. F. Kemp. A study of contact zones, especially discussing garnet. 4500 w. Jour Can Min Inst — Vol. XV. No. 42041 N.

Gas Fields

Kansas and Oklahoma Gas Fields. Lucius L. Wittich. Explains conditions affecting the gas supply, and describes compressor plants for transporting gas in pipes. Ills. 3000 w. Mines & Min—Feb., 1913. No. 39627 C.

Geology

Is the Siebenbürgen District to Be Considered as a Natural Gas Field in Conjunction with Potash and Petroleum (Ist in Siebenbürgen neben den Erdgasmit Kali- und Petroleumfunden zu rechnen)? Dr. Herbing. A study of the peculiar geological formation of this region in Austria, as determined from gas well borings. Ills. 4900 w. Glückauf—March 15, 1913. No. 41416 D.

Graphite

The Geology of the Graphite Deposits of Pennsylvania. Benjamin L. Miller. Gives the history, origin, etc. 5000 w. Ec-Geol—Dec., 1913. No. 39343 D.

The Graphite Industry of Pennsylvania. Benjamin L. Miller. Describes the geology and mining methods, concentration, uses, etc. Ills. 2500 w. Min & Engng Wld — March 29, 1913. No. 40970.

Gypsum

Artificial Stone from Gypsum. Remarks on the value of gypsum and the

MINOR MINERALS**Natural Gas**

uses to which it may be applied. 2000 w. Builder—Sept. 26, 1913. No. 45724 A.

Oklahoma Gypsum Deposits and Industry. L. C. Snider. Map and description of deposits and the manufacture of gypsum products. Ills. 2500 w. Eng & Min Jour—May 10, 1913. No. 41958.

Lime

See also same heading under CIVIL ENGINEERING, *Materials of Construction*.

Manganese

On the Occurrence of Manganese at New Ross in Nova Scotia. H. E. Kramm. Describes the deposits, discussing the origin of the ore. Ills. 2000 w. Jour Can Min Inst—Vol. XV. No. 42043 N.

Determination of Manganese as Sulfate and by the Sodium Bismuthate Method. William Blum. Explains the importance of accurate manganese determinations, outlines the bismuthate method and its history, explaining the work and results. 7000 w. Bul Bureau of Stand—March 1, 1913. No. 42930 N.

Marble

The Marble Industry of Carrara, Italy. Juan Blanquier. Describes the geology of the Apuan Alps, the winning of the marble, its conveyance, and related matters of interest. 2000 w. Min Jour—Sept. 13, 1913. No. 45291 A.

Mercury

Extraction, Properties and Uses of Mercury. 1500 w. Min & Engng Wld—Oct. 25, 1913. No. 46218.

Mica

The Production and Uses of Mica. J. F. Springer. Information concerning this product and its applications. 3000 w. Cassier's Mag—Nov., 1912. No. 38366 B.

Mica Mining in Canada. Hugh S. De Schmid. Information concerning the deposits, mining methods, and production. 7500 w. Qr Bul of Can Min Inst—March, 1913. No. 41595 N.

The India Mica Industry. Abner F. Dixon. Describes the geology, mica deposits, methods of mining, preparation for market, etc. Ills. 6000 w. Bul Am Inst of Min Engrs — May, 1913. No. 42461 F.

Mica Mining in Canada in 1912. Hugh S. De Schmid. Abstract of a paper read before the Can. Min. Inst. Deals with the methods, deposits, grades, etc. 1800 w. Min & Engng Wld—May 31, 1913. No. 42633.

Natural Gas

Natural Gas, with Incidental Reference to Other Bitumens. I. N. Knapp. Illustrated historical sketch of bitumen and its surface indications, the origin, geology, classification of oil and gas accumu-

Consult Classification of the Index. See page 9.

Natural Gas

lations, etc. 5000 w. Jour Fr Inst—Nov., 1912. Serial. 1st part. No. 37540 D.

Measurement of Natural Gas. Thomas R. Weymouth. Describes methods, giving the proper formulae to be used with them. 3000 w. Jour Am Soc of Mech Engrs—Nov., 1912. No. 37877 D.

Natural Gas in Oklahoma. Charles N. Gould. A discussion of the location and quantity of natural gas in this field. 4500 w. Mfrs' Rec—Jan. 2, 1913. No. 38776.

Petroleum and Natural Gas in Oklahoma. C. N. Gould. Gives a résumé of existing conditions and the future possibilities. 5000 w. Ec-Geol—Dec., 1912. No. 39339 D.

Wastes in the Production and Utilization of Natural Gas and Means for Their Prevention. Ralph Arnold and Frederick G. Clapp. Deals with the distribution, development, wastes, and efforts to prevent waste. 9500 w. U S Bureau of Mines—Tech Paper 38. No. 42449 N.

Manufacture of Gasoline from Natural Gas. Charles T. Hutchinson. Descriptive account of this industry, discussing its possibilities in the California oilfields. 3000 w. W Engng—May, 1913. No. 42270 C.

Outline of the Geology of Natural Gas in the United States. Frederick G. Clapp. The distribution, production, description of individual fields, geology and origin are considered. Maps. 6000 w. Ec-Geol—Sept., 1913. No. 45824 D.

See also Gasoline, under MECHANICAL ENGINEERING, *Combustion Motors*.

Nickel

The Nickel Industry: With Special Reference to the Sudbury Region, Ontario. A. P. Coleman. A monograph describing all the known nickel ore deposits in Ontario, methods of mining and smelting the ores, and an account of the chief nickel regions of other countries. Maps & Ills. 206 pp. Can Dept of Mines—No. 170. No. 44490 N.

Canada's Nickel Industry. Alexander Gray. From *Jour. of Commerce*. A review of the history of the development. 3500 w. Can Min Jour—Oct. 1, 1913. Serial, 1st part. No. 45694.

See also Nickel-Copper Ore, under *Copper*

Nitrates

Occurrence of Nitrate Deposits in Nevada. Hoyt S. Gale. Abstracted from Bul. 523, U. S. Geol. Surv. Describes deposits of nitrate salts near Lovelock, giving analyses of samples. 2500 w. Min & Engng Wld—Dec. 7, 1912. No. 38092.

The Nitrate Fields of Chile. Dr. Wal-

ter S. Tower. Describes these nitrate deposits and discusses their formations, fertilizing value, and effect upon Chile, mining, preparation for export, and features of the business. Ills. 6500 w. Pop Sci M—Sept., 1913. No. 45176 C.

Oil

Temperature in Oil Regions. Dr. Hans V. Höfer. Gives results of measurements and considers their value. 1000 w. Ec-Geol—Sept., 1912. No. 37669 D.

The Oil Industry in Peru. R. A. Deustua. Describes the three great zones and their deposits in the present article. 2500 w. Min Jour—Nov. 30, 1912. Serial. 1st part. No. 38117 A.

Methods for the Determination of Water in Petroleum and Its Products. Irving C. Allen and Walter A. Jacobs. Deals with methods for accurately determining the water content. 3000 w. U S Bureau of Mines—Tech paper 25. No. 38669 N.

The Oil Industry of California. Information from a recent report to the Commercial Club of San Francisco. Deals with production, resources, conservation, etc. 3000 w. Eng News—Feb. 6, 1913. No. 39708.

Shipping and Sampling Crude Oil. Paul M. Paine. Information concerning the transportation and marketing of crude oil. 2500 w. W Engng—July, 1913. No. 44046 C.

The Scottish Shale Oil Industry. A. E. von Groeling. General description of a Scottish refinery, and the shale retorts of old and modern types and their working. Ills. 4000 w. Engr. Lond—Aug. 29, 1913. Serial, 1st part. No. 45042 A.

Cost of Pumping Oil by Electricity in the California Oilfields. S. G. Gassaway. Gives comparative data of steam and electric operation, showing electric power results in substantial saving. Ills. 1200 w. W Engng—Oct., 1913. No. 46359 C.

The Oil Outlook in Russia. E. de Hautpick. An explanation of the present position of the Russian petroleum industry. 1500 w. Min Jour—Oct. 18, 1913. No. 46227 A.

Oilfields

The Structural Relations of the Oil Fields of Crawford and Lawrence Counties, Illinois. Raymond S. Blatchley. Gives structural maps, describing their oil, gas and salt water relations. 2500 w. Ec-Geol—Sept., 1912. No. 37673 D.

Methods and Cost of Drilling in the California Oilfields. A. T. Parsons. Describes the drilling methods in the California fields, the equipment needed, and costs. 2500 w. Engng & Con—Dec. 11, 1912. No. 38146.

Consult Classification of the Index. See page 9.

Oil Fields

MINOR MINERALS

Petroleum

The Lack of Association of the Irregularities of the Lines of Magnetic Declination and the Petroleum Fields. W. A. Tarr. Gives Dr. Becker's views and after a careful study of the charts concludes that there is no connection. 5000 w. *Econ. Geol.*—Oct.-Nov., 1912. No. 38502 D.

Structure of the Principal Oil Fields of Illinois. Raymond S. Blatchley. Map and description of the oil, gas and salt-water relations of these fields. 2000 w. *Min & Engng Wld*—Dec. 14, 1912. No. 38211.

Graphic Representation of Oilfield Structure. Alexander J. Heindl. Outlines methods used to represent underground structure in the oilfields, especially considering the method of stereographic projection. 1800 w. *Min & Sci Pr*—Dec. 28, 1912. No. 38765.

Electric Power in the Kern and Midway Oil Fields. Warren Aikens. Explains the advantages of motor drive, illustrating and describing the hydraulic development, and power plants, plant equipment, etc. 4500 w. *Min & Engng Wld*—Jan. 11, 1913. Serial. 1st part. No. 39115.

The Carlinville Oil and Gas Field. Fred H. Kay. A preliminary report, giving information designed to meet the needs of operators who are attempting to locate the most favorable areas. Map. 4000 w. *Illinois State Geol Survey*—Extract from Bul 20. No. 41720 N.

The Carlyle Oil Field and Surrounding Territory. E. W. Shaw. Attempts to point out certain areas where the geological structure is favorable for the accumulation of oil and gas in the region surrounding Carlyle, Ill. Maps. 10800 w. *Illinois State Geol Survey*—Extract from Bul 20. No. 41719 N.

The Oil-Fields of Burma. N. G. Cholmeley. An interesting account of this field and its development. General discussion. Ills. 18000 w. *Jour Soc of Arts*—May 16, 1913. No. 42524 A.

Oil Industry

The Economic Aspect of the Oil Industry in Austria-Hungary (Die wirtschaftliche Lage der Petroleumindustrie in Oesterreich-Ungarn). Siegmund Stranisky. A review of the productiveness of the country, imports, and relative costs. 2600 w. *Zeit des Oest Ing u Arch Ver*—Jan. 24, 1913. No. 40546 D.

Oil Refineries

British Home Oil Refineries. A. E. v. Groeling. Shows that the possession of home refineries has become an urgent necessity. 1500 w. *Engr, Lond*—July 25, 1913. No. 44190 A.

Oil Wells

The Cementing Process of Excluding Water from Oil Wells as Practiced in

California. Ralph Arnold and V. R. Garfias. Discusses the exclusion of water from oil wells, the two general methods of cementing oil wells, with recommendations and suggestions. 3500 w. *U S Bureau of Mines*—Tech Paper 32. No. 40625 N.

Gas and Oil Wells in Coal Fields. George S. Rice. Discusses problems where gas or oil wells extend through or near coal mines, and the laws necessary for the safe development. 2000 w. *Min & Engng Wld*—March 22, 1913. No. 40771.

The Use of Cement for Excluding Water from Oil Sands in Drilling Wells. Paul M. Paine. Describes methods used for preventing water encroachment into oil-bearing strata. Ills. 2500 w. *Pro Am Soc of Civ Engrs*—May, 1913. No. 42908 F.

California Oil-Well Drilling Practice. B. K. Stroud. Illustrated detailed description of methods employed. 5800 w. *W Engng*—Aug., 1913. No. 44385 C.

Deep Wells of Findlay, Ohio. D. Dale Condit. Records of the Norris and Graff wells. Also Note on the Temperature in the Deep Borings at Findlay, Ohio, by John Johnston. 4000 w. *Am Jour of Sci*—Aug., 1913. No. 44377 D.

The Prevention of Waste of Oil and Gas from Flowing Wells in California. Ralph Arnold and V. R. Garfias. With a discussion of special methods used by J. A. Pollard. Describes certain methods of preventing some of the waste incident to oil mining. Ills. 4000 w. *U S Bureau of Mines*—Tech paper 42. No. 44485 N.

See also Drilling, under *Mining*.

Ozokerite

Origin of Cheleken Ozokerite Deposits. E. de Hautpick. Describes deposits on islands in the Caspian Sea, showing that they originate in oil-bearing strata, the petroleum turning into natural wax. 1200 w. *Min Jour*—Dec. 21, 1912. No. 38881 A.

Petroleum

Petroleum Industry in the United States in 1912. Reviews the production and prices during the year in American and foreign fields. 3500 w. *Min & Engng Wld*—Jan. 25, 1913. No. 39420.

Petroleum in the United States. Reviews of production and interesting features in the various oil fields. 6000 w. *Eng & Min Jour*—Jan. 11, 1913. No. 38995.

The Taranaki Petroleum Field. E. de Courcy Clarke. Abstract from the N. Z. Geol. Soc. Report. An account of the attempts to obtain oil in Taranaki, and the

Consult Classification of the Index. See page 9.

Petroleum

success. 1500 w. Min Jour—Feb. 8, 1913. Serial, 1st part. No. 39907 A.

Methods for the Determination of Water in Petroleum and Its Products. Irving C. Allen and Walter A. Jacobs. Brief description of the methods, with conclusions. 2500 w. U S Bureau of Mines—Tech Paper 25. No. 41634 N.

The Optical Activity of Petroleum and Its Significance. F. W. Bushong. Address of retiring president of the Kansas Acad. of Science. Gives new light on the nature and origin of mineral oil. 2500 w. Sci Am Sup—Aug. 9, 1913. No. 44218.

Petroleum and Natural Gas in Mid-Continent Field. Charles N. Gould. Information concerning the S-E Kansas and E. Oklahoma field, the development, production, etc. 3300 w. Mfrs' Rec—Aug. 14, 1913. No. 44360.

Petroleum Products

The Manufacture of Petroleum Products. Dr. F. C. Robinson. An exposition of the products, including gasoline, naphtha, lamp oil, gas oil, etc., paraffin wax and other products. Ills. 4500 w. Pro Engrs Club of Phila—April, 1913. No. 42367 D.

Phosphate

Rock Phosphate in Kentucky. James H. Gardner. Describes the geological formation, the deposits and methods of working. Ills. 2500 w. Mines & Min—Nov., 1912. No. 37189 C.

Florida Phosphate Practice. John Allen Barr. Illustrates and describes hydraulic mining, steam shovel work, etc. 5700 w. Mines & Min—Dec., 1912. No. 38008 C.

Hydraulic Mining of Phosphate Rock. C. B. Pentecost. Gives results of a careful tour of inspection of the phosphate properties in Florida. Shows the advantages of the electric drive. Ills. 3500 w. Gen Elec Rev—July, 1913. No. 43332 C.

Phosphatic Fertilizers. W. Palmer. Read before the Int. Cong. of Ap. Chem. A discussion of the electrolytic process, giving an account of investigations and a statement of the advantages. 3500 w. Chem Engr—July, 1913. No. 43857 C.

Fertilizer Without Sulphuric Acid? Albert Phenix. Discussion of the new process for rendering phosphate rock soluble. 2500 w. Mfrs' Rec—July 24, 1913. No. 43849.

Phosphate Deposits of Egypt. John Bell. Information from a report to the Egyptian Minister of Finance concerning the different districts. 1000 w. Min Jour—Aug. 9, 1913. No. 44505 A.

MINOR MINERALS**Potash**

The Discovery and Opening of a New Phosphate Field in the United States. Charles Colcock Jones. An outline of work demonstrating the existence of a very large phosphate field in northeastern Utah, southeastern Idaho and western Wyoming, with information concerning it. Ills. 6000 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46349 F.

Phosphate Mining

Gas Engine and Steam Turbine Power Plants. W. C. Turner. Illustrated description of hydraulic pumps used to supply water to nozzles for washing down phosphate rock, power plants consisting of gas producers and gas engines directly connected to electric generators. 1400 w. Power—April 8, 1913. No. 41124.

Potash

The Extraction of Potash from Silicate Rocks. William H. Ross. Abstract of paper read before the Int. Cong. of Ap. Chem. Gives results of a comparative study of processes for which patents have been allowed with a view of finding what methods, if any, give promise of being practicable commercially. 3500 w. Met & Chem Engrg—Nov., 1912. No. 37252 C.

The Production of Available Potash from the Natural Silicates. Allerton S. Cushman and George W. Coggeshall. Abstract of paper read before the Int. Cong. of Ap. Chem. 5000 w. Met & Chem Engrg—Nov., 1912. No. 37251 C.

The Production of Available Potash from the Natural Silicates. Allerton S. Cushman and George W. Coggeshall. Read at the Cong. of Ap. Chem. Examines the six general methods proposed for decomposing the natural silicates to obtain potash; a résumé of experiments; with conclusion. 6500 w. Jour Fr Inst—Dec., 1912. No. 38396 D.

The Formation and Structure of the German Potash Beds. Dr. H. Boeke. Describes these valuable deposits. Ills. 2000 w. Sci Am Sup—June 28, 1913. No. 43202.

The Searles Lake Potash Deposit. C. E. Dolbear. Describes the character of this deposit in California and gives information concerning its recent discovery. Ills. 2200 w. Eng & Min Jour—Feb. 1, 1913. No. 39633.

Searles Lake Potash Deposits. H. S. Gale. Information from advance chapter on potash in "Mineral Resources of the U. S. for 1912," published by the U. S. Geol. Survey. 2000 w. Min & Sci Pr—July 12, 1913. No. 43746.

Progress in Potash Prospecting in Railroad Valley, Nevada. E. E. Free. Information concerning progress made in

Precipitation

the search for a potash deposit in Nevada. 2500 w. *Min & Sci Pr*—Aug. 2, 1913. No. 44220.

The Supply of Potash in the United States (Die Versorgung der Vereinigten Staaten von Nordamerika mit Kali). Herr Bentz. Statistics on production and available resources. 3600 w. *Glückauf*—Aug. 16, 1913. No. 45385 D.

Kelp and Other Sources of Potash. Frank K. Cameron. Considers fertilizer problems, the sources of potash, especially the sea-weeds and rock-weeds of the Pacific Coast known as the "Giant Kelps." Ills. 8400 w. *Jour Fr Inst*—Oct., 1913. No. 46315 D.

Precipitation

Determination of Nickel and Cobalt. R. L. Hallett. Describes a method particularly useful for the determination of small amounts of either metal in the presence of large amounts of the other. 1500 w. *Eng & Min Jour*—April 26, 1913. No. 41545.

Pyrophyllite

Pyrophyllite in North Carolina. Claud Hafer. Illustrated account of the deposits in North Carolina and their development. 2000 w. *Eng & Min Jour*—Oct. 4, 1913. No. 45668.

Pyrrhotite

The Discovery of Pyrrhotite in Wisconsin, with a Discussion of Its Probable Origin by Magmatic Differentiation. Rufus Mather Bagge. Gives the location and geology of the region. 1200 w. *Ec-Geol*—June, 1913. No. 42951 D.

Salt

Salt Subsidiencies at Northwich. Illustrated account of present conditions in the Cheshire Salt Field, England, and the effect on the surface level. 2000 w. *Engr, Lond*—Dec. 13, 1912. No. 38529 A.

Sulphates

Occurrence of Complex and Little Known Sulphates and Sulpharsenates as Ore Minerals in Utah. B. S. Butler. Illustrates and describes plumbojarosite, beaverite, beudantite and allied minerals and their occurrence. 3000 w. *Ec-Geol*—June, 1913. No. 42947 D.

Sulphides

A Magmatic Sulphide Ore Body at Elkhorn, Montana. Adolph Knopf. Describes ore deposits in Montana, discussing the origin of the ore body. Ills. 3500 w. *Ec-Geol*—June, 1913. No. 42948 D.

Sulphur

The Origin of Sulphur Deposits. O. Stutzer. An explanation of the forms of sulphur deposits and their origin. Ills. 3500 w. *Ec-Geol*—Dec., 1912. No. 39340 D.

MINOR MINERALS**Tin**

Development of Sulphur Deposits in Texas. W. D. Hornaday. Describes the sulphur mining equipment at Bryan Heights, Tex., where steam is forced into the deposit, and by means of pressure brings the molten sulphur to the surface. Ills. 1200 w. *Min & Engng Wld*—Feb. 1, 1913. No. 39641.

The Sulphur of Sicily. Juan Blanquiere. Abstract translation. Describes the deposits and gives the theory of their origin most generally accepted, the system of working and treatment, the mines, transport, etc. 4000 w. *Min Jour*—June 28, 1913. No. 43627 A.

Tar

See same heading, under **MECHANICAL ENGINEERING, Materials of Construction.**

Tin

Prospecting for Tin in Nigeria. John T. Keating. Suggestions and directions. 1200 w. *Min Mag*—Nov., 1912. No. 37906 B.

Nigerian Tin; Its Occurrence and Origin. J. D. Falconer. Describes these tin-fields and their development and outlook. 1500 w. *Ec-Geol*—Sept., 1912. No. 37670 D.

The Transvaal Tin Deposits. An account of the geological features of the occurrences in the Waterberg district. Ills. 6500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37853 N.

The Zaaipplaats Tin Mines. George H. Furner. Illustrated description of these mines in Africa. 1500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37867 N.

Mount Holmes Tin Mine. Lionel C. Ball. Describes the geological conditions, the work done, and the work required. 3000 w. *Queens Gov Min Jour*—Nov. 15, 1912. No. 38232 B.

Tin Discoveries at Redrock, Near Balandean, Stanthorpe District. E. O. Marks. Illustrated description of tin-bearing lodes in Queensland. 2500 w. *Queens Gov Min Jour*—Nov. 15, 1912. No. 38231 B.

Notes on the Direct Volumetric Determination of Tin. A. J. B. Rawlins. An investigation of the reliance to be placed upon the direct determination in a technical manner. 2500 w. *Inst of Min & Met, Bul* 99—Dec. 12, 1912. No. 38878 N.

Notes on the Valuation of Nigerian Tin Concentrate. R. T. Hancock. Describes two methods which require little apparatus, and no chemical knowledge, but are capable of giving close results. 2500 w. *Inst of Min & Met, Bul* 99—Dec. 12, 1912. No. 38879 N.

On the Dressing of Tin Ores in Cornwall. W. Fischer Wilkinson. Informa-

Tin**ORE DRESSING AND CONCENTRATION****Blast Roasting**

tion concerning the losses, showing that the recoveries made are far lower than generally supposed. 4500 w. *Inst of Min & Met*, Bul 99—Dec. 12, 1912. No. 38877 N.

The Ardlethan Tin Lodes (N. S. W.). E. F. Pittman. Official report giving information concerning various claims. 2500 w. *Aust Min Stand*—Dec. 12, 1912. No. 38859 B.

The Tin Industry in 1912. Reviews production and prices, and the New York tin market. 1800 w. *Eng & Min Jour*—Jan. 11, 1913. No. 38984.

Prospects of Tin Lodes in Banka. J. G. Bijddendijk. Abstract from the *Jaarboek Van Het Mijnwezen*. Information concerning these deposits, which have furnished in recent years about one-seventh of the world's tin production. 2000 w. *Min Jour*—Feb. 8, 1913. Serial, 1st part. No. 39908 A.

Further Contributed Remarks on "The Dressing of Tin Ores in Cornwall." W. Fischer Wilkinson. 10500 w. *Inst of Min & Met*, Bul 101—Feb. 13, 1913. No. 40217 N.

Geology of the Rooiberg Tinfields. H. Kynaston. From reports of the S. African Geol. Survey. Notes based on observations and information concerning deposits. 2500 w. *Min Jour*—March 1, 1913. No. 40477 A.

Kangaroo Hills. E. O. Marks. Illustrated notes on tin deposits in Queensland, and their development. 2000 w. *Queens Gov Min Jour*—Feb. 15, 1913. No. 40811 B.

The Tin Situation in Bolivia. Howland Bancroft. Explanation of conditions af-

fecting the tin situation, and the possibilities of this field. 5000 w. *Bul Am Inst of Min Engrs*—Sept., 1913. No. 45469 F.

Treatment of Tinstone and Wolframite. Otto Falkenberg. Describes methods used in the concentrating plant at Geysersberg. 1500 w. *Min Jour*—Aug. 23, 1913. No. 44908 A.

Mining in Katanga, Congo Belge. R. H. Gwyn-Williams. Information concerning the tin deposits, describing the principal prospects at present being opened. 2500 w. *Min Jour*—Aug. 23, 1913. Serial, 1st part. No. 44909 A.

See Electrometallurgy, under *Minor Minerals*.

Tungsten

The Chemistry of Tungsten. Charles Baskerville. Extracts from a lecture delivered before the N. Y. Elec. Soc. Considers the chemical treatment of the concentrates, the preparation of tungsten, the manufacture of metallic tungsten and ferro-tungsten, and the uses of some tungsten compounds. 2000 w. *Met & Chem Engng*—June, 1913. No. 42604 C.

Tungsten in Boulder County, Colo. Leroy A. Palmer. Describes the deposits in this county, which furnishes 60 per cent. of U. S. tungsten. The mines and concentrating systems are also described. Ills. 5500 w. *Eng & Min Jour*—July 19, 1913. No. 43792.

See Tin, under *Minor Minerals*, and Tungsten, under *ELECTRICAL ENGINEERING*, *Lighting* and Tungsten, under *MECHANICAL ENGINEERING*, *Materials of Construction*.

ORE DRESSING AND CONCENTRATION**Agitators**

Continuous Agitation of the West End Mill, Tonopah. Jay A. Carpenter. Describes the satisfactory work of the Trent agitators. Ills. 6500 w. *Min & Sci Pr*—May 3, 1913. No. 41938.

The Symmes Agitator. Whitman Symmes. Detailed description of this agitator and its operation. Ills. 1500 w. *Min & Sci Pr*—July 19, 1913. No. 43852.

Analysis

Rapid Silver Estimation in Mill Solutions. G. H. Clevenger. Gives a rapid volumetric method for estimating the amount of silver in the solutions in cyanide mills. Ills. 1200 w. *Eng & Min Jour*—May 3, 1913. No. 41859.

Australia

Metallurgical Tendencies in Western Australia. W. A. MacLeod. Impressions

showing a healthy state of progress in gold milling, describing some recent plants. 1500 w. *Min & Sci Pr*—Sept. 13, 1913. No. 45243.

Automatic Extraction

A New Automatic Extraction Process. Gaston Jacquier. Details relating to the treatment of zinc-sulphate, copper-sulphate, and arsenic-sulphide solutions. 2500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37872 N.

Bag-House

The Bag-House at the Murray Smelter, Utah. A. Eilers. Abstract from *Pro. of Am. Min. Inst.* Illustrates and describes the construction and operation. 3000 w. *Min & Chem Engng*—July 5, 1913. No. 43448.

Blast-Roasting

Blast-Roasting of Sulphide Ores. J. H. Levings. A short report of the author's

Consult Classification of the Index. See page 9.

Briquetting

experience. 1200 w. Inst of Min & Met, Bul 100—Jan. 9, 1913. No. 39551 N.

An early example of Blast-Roasting. H. Vassiliadi. Describes a primitive form of application of this process. 1000 w. Inst of Min & Met, Bul. 104—May 15, 1913. No. 43158 N.

Briquetting

Concentration, Briquetting and Agglomeration of Iron Ore and Flue Dust (Anreichern, Brikettieren und Agglomerieren von Eisenerzen und Gichtstaub). K. Sorge. Reviews the production of pig iron throughout the world; the necessity of conserving resources, and the several processes of iron-ore concentration. Diagrams. Serial, 1st part. 4200 w. Stahl u Eisen—Jan. 23, 1913. No. 40006 D.

The Scoria Process for the Manufacture of Fine-Ore Briquettes, Flue-dust Briquettes and Slag Brick for Building Purposes. Ernest Stütz. Description of process using slag in preparing materials for smelting in blast furnaces. Ills. 2100 w. Bul Am Inst Min Engrs—July, 1913. No. 44016 F.

See also Briquettes, under *Coal and Coke*.

Chilean Mills

Crushing in Slow-Speed Chile Mills in So. Dakota. Jesse Simmons. Illustrated description of a plant at Maitland in which Chile mills have been installed for grinders. 1800 w. Min & Engrg Wld—Nov. 2, 1912. No. 37268.

Chilian Mills. G. A. Denny. Abstract of a discussion in Bul. of Mex. Inst. of Min. & Met. Aims to show the disadvantages of the slow-speed mill and the superiority of the higher speed. 4000 w. Can Min Jour—Dec. 15, 1912. No. 38353.

Classifiers

Hydraulic Classification. G. A. Robertson. Describes types of classifiers and some of the difficulties and how to overcome them. 3000 w. S African Min Jour—Sept., 1912. (Special.) No. 37871. N.

Application of Hindered Settling to Hydraulic Classifiers. Earl S. Bardwell. Discusses facts which have thrown light on the question of proper ratio between the area of the sorting column and the area of the constriction. 4000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44745 F.

The Anaconda Classifier. Robert Ammon. Sketch of the development of this hindered-settling classifier, showing the results obtained in practice. Ills. 6000 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44761 F.

ORE DRESSING AND CONCENTRATION**Concentrates**

Treatment of Concentrate at the Goldfield Consolidated Mill. J. W. Hutchinson. Detailed description of process. 1500 w. Min & Sci Pr—Jan. 25, 1913. Serial, 1st part. No. 59576 C.

Concentrating

The No. 2 Unit of the Mill of the Bunker Hill & Sullivan Mining & Concentrating Co. R. S. Handy. Describes the process after the ore enters the concentrating department, analyzing the products of each separate process. 2000 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39447 F.

Concentration

Sand, Slime and Colloids in Ore Dressing. Gelasio Caetani. Defines the terms as used, and shows how the operations of settling, conveying and concentrating are affected by the viscosity of the liquid. 5000 w. Min & Sci Pr—March 22, 1913. No. 40837.

Calculation of Extraction in Concentration. William S. Welton. Discusses extraction percentages, reporting tests. 2000 w. Eng & Min Jour—July 12, 1913. No. 43668.

Concentration of Telluride Ores. Henry E. Wood. Describes a system combining flotation and subsequent gravity separation. 1200 w. Eng & Min Jour—May 3, 1913. No. 41858.

Conical Mills

The Hardinge Conical Mill. H. W. Hardinge. Illustrated description, with a comparison of results with a Chilean mill. 3000 w. Bul Am Inst of Min Engrs March, 1913. No. 40899 F.

Crushers

Huntington Mill Practice at Kalgoorlie. M. W. von Bernewitz. Deals chiefly with Huntington mill practice, and discusses the treatment of low-grade oxidized ores at the small mines. Ills. 2500 w. Min & Sci Pr—Nov. 16, 1912. No. 37714.

Dry vs. Wet Crushing at Kalgoorlie. M. W. von Bernewitz. A review of the gold treatment problem at Kalgoorlie. 1500 w. Min & Sci Pr—March 15, 1913. No. 40723.

Hardinge Conical Mill. H. W. Hardinge. Illustrated account of its development and working, explaining its advantages. 3000 w. Jour Can Min Inst—Vol XV. No. 42038 N.

The Crushing Surface Diagram. Arthur O. Gates. An effort to reduce to graphic form the exposition of the energy absorbed in reducing rock from one size to a smaller one. A convenient means of comparing crushing efficiencies. 2000 w. Eng & Min Jour—May 24, 1913. No. 42382.

Crushers

Cyanide Plants

See also Gravel, under **CIVIL ENGINEERING**, *Materials of Construction*.

Crushing

Mechanical Efficiency in Crushing. Algernon Del Mar. Explains a system worked out for making a comparison of amounts of work done by various machines. 4000 w. Eng & Min Jour—Dec. 14, 1912. No. 38193.

Cyanide Plants

Cyanide Plant at the Empire Mines, Grass Valley. Frank A. Vestal. Illustrated details description. 3500 w. Min & Sci Pr—Nov. 9, 1912. No. 37558

Cyaniding at the Dome Mill. Herbert A. Megraw. Illustrated description of a modern mill in the Porcupine district, Ontario, for cyaniding gold ores. 3500 w. Eng & Min Jour—Nov. 23, 1912. No. 37763.

Hollinger Cyanide Mill, Porcupine. Herbert A. Megraw. Illustrated description of a new 400-ton cyanide mill in northern Ontario. 4000 w. Eng & Min Jour—Dec. 21, 1912. No. 38350.

Cyanide Practice in the Black Hills. Herbert A. Megraw. Fifth article of a series describing American cyanide practice. A résumé of cyanidation in this mining district, which was the first in America to use cyanidation for low-grade ores. 111s. 7000 w. Eng & Min Jour—Dec. 28, 1912. No. 38584.

The Rosario Cyanide Plant. A. L. Sweetser. Illustrated description of this plant in Honduras, and its operation. The machinery is motor driven. 1500 w. Min & Sci Pr—Dec. 14, 1912. No. 38306.

Cyanide Process

The Forcing of a Process. Alfred James. History and review of the advent of the cyanide process that revolutionized gold mining. 4500 w. S African Min Jour—Sept., 1912. (Special.) No. 37841 N.

Cyanide Treatment. Leslie Stuart Muir. An outline of a possibility of the future. 2000 w. S African Min Jour—Sept., 1912. (Special.) No. 37870 N.

Cyanidation in the Cobalt District. Herbert A. Megraw. Discusses the treatment of rich silver ores. 111s. 5000 w. Eng & Min Jour—Nov. 2, 1912. No. 37244

The Cyanide Process on the Rand. William Bettel. Reviews the progress of the cyanide process on the Witwatersrand since 1891. 10000 w. S African Min Jour—Sept., 1912. (Special.) No. 37860 N.

Cyaniding

Cyaniding Slimy Ore by Continuous Decantation. H. C. Parmelee. Reviews the status of this important departure. 111s.

ORE DRESSING AND CONCENTRATION**Electrochemistry**

2500 w. Met & Chem Engng—Jan., 1913. No. 38970 C.

Cyaniding at the Wasp No. 2 Mill, Black Hills. Jesse Simmons. Illustrated description of methods with figures and statistics of operations. 2200 w. Min & Engng Wld—Jan. 4, 1913. No. 38829.

Cyanidation at the Liberty Bell Mill. Herbert A. Megraw. Illustrates and describes methods of testing an ore containing both gold and silver. 3000 w. Eng & Min Jour—Jan. 4, 1913. No. 38808.

Review of Cyanidation in 1912. Philip Argall. Reviews present practice. Also Analysis of Cyanide Practice. Herbert A. Megraw. 4000 w. Eng & Min Jour—Jan. 11, 1913. No. 38991.

A Study of Cyanide Precipitates. G. H. Clevenger. Discusses the possible sources of the principal elements found in cyanide precipitates and their effects. 1500 w. Eng & Min Jour—Feb. 1, 1913. No. 39634.

Cyanidation at Cripple Creek, Colo. Herbert A. Megraw. Illustrated review of the cyanide operations at this camp. 2500 w. Eng & Min Jour—Feb. 8, 1913. No. 39737.

Silver Cyanidation at Tonopah. Illustrated account of methods which show the efficiency of the cyanide process applied to silver ores. 3500 w. Eng & Min Jour—Feb. 22, 1913. Serial, 1st part. No. 39998.

Desulphurizing

The Hall Ore Desulphurizing Process. William A. Hall. Brief description of a novel process eradicating all noxious smelting fumes. 1500 w. Eng & Min Jour—July 5, 1913. No. 43483.

Desulphurizing Silver Ores at Cobalt. James J. Denny. An account of experimental work at Nipissing low-grade mill with a view to discovering an effective method of desulphurizing Cobalt ores, and the process developed. 111s. 3500 w. Min & Sci Pr—Sept. 27, 1913. No. 45627.

Electric Power

See **Hydroelectric**, under **ELECTRICAL ENGINEERING**, *Generating Stations*.

Electrochemistry

Electrochemical Activity Between Solutions and Ores. Roger C. Wills. Calls attention to electromotive action caused by different solutions acting either on a single mineral or on a combination of minerals. 2000 w. Ec-Geol—Sept., 1913. No. 45828 D.

Innovations in Electro-Chemical Treatment of the Noble Metals (Neues aus der Elektrochemie der Edelmetalle). F. Körner. Examples of the use of calcium cyanamid in the treatment of ores.

Consult Classification of the Index. See page 9.

Filtration

Serial, 1st part. 1800 w. *Elektrochem Zeit*—Sept., 1912. No. 46072 D.

Filtration

Notes on Bag-Filtration Plants. A. Eilers. Discusses the employment of the bag-house in connection with lead blast-furnaces and with such copper-converting plants as treat mainly leady copper-mattes, derived from lead blast-furnace smelting. Ills. 6000 w. *Bul Am Inst of Min Engrs*—Jan., 1913. No. 39450 F.

Conditions Governing Washing of Filter Cakes. A. W. Warwick. Discusses conditions which affect the speed and completeness of washing. 3000 w. *Min & Engng Wld*—April 26, 1913. No. 41651.

Washing Gold and Silver from Filter Cakes. A. W. Warwick. Considers the remarkable completeness of the wash, the value of the unwashed cakes, methods of washing and the recovery of chemicals. 1200 w. *Min & Engng Wld*—April 5, 1913. No. 41079.

Vacuum Filtration at the Victoria Mill of the Waihi Gold Mining Co., Ltd., New Zealand. William Macdonald. An account of local practice and results achieved with the movable or Moore type of slime vacuum filter. Ills. 6500 w. *Jour Chem Met & Min Soc of S. Africa*—May, 1913. No. 43888 E.

Flotation

The Wood Flotation Process. Henry E. Wood. Results of the writer's investigations in flotation with illustrated descriptions of machines for ore-concentrating. 5800 w. *Bul Am Inst of Min Engrs*. Nov., 1912. No. 37547 F.

Broken Hill Treatment Methods. J. Malcolm Newman. A review of the treatment methods with special reference to the selective flotation process. 3500 w. *Aust Min Stand*—June 26, 1913. No. 43887 B.

Flotation Processes

The Macquisten Tube Flotation Process. O. B. Hofstrand. Detailed description of the process and report of the degree of efficiency. 1500 w. *Bul Am Inst of Min Engrs*—Jan., 1913. No. 39448 F.

Concentration by Flotation. Edward Walker. Remarks on the patent litigation and flotation processes used. Ills. 1500 w. *Min & Sci Pr*—Jan. 4, 1913. (Special.) No. 38924 C.

Minerals Separation Flotation Plant at Kyoee Copper Mines, N. S. H. Hardy Smith. Drawings and description of the flotation machine and arrangement of mill, operation and results. 5000 w. *Met & Chem Engng*—March, 1913. No. 40330 C.

Minerals Separation, Ltd., v. James

ORE DRESSING AND CONCENTRATION

Hydrometallurgy

M. Hyde. Abstract from Judge Bourquin's decision in a suit for infringement. 1800 w. *Min & Sci Pr*—Aug. 16, 1913. No. 44530.

Fumes

What Has Been the Fume Damage in California? L. H. Eddy. Considers the present agitation unjustifiable, and the damage not as claimed. 2000 w. *Eng & Min Jour*—July 26, 1913. No. 43929.

Common Sense of the Fume Question. Herbert Lang. Explains the nature of smelter smoke and discusses the problem and what has been accomplished. 4000 w. *Min Sci Pr*—Aug. 30, 1913. No. 44950.

See also Desulphurization, under *Ore Dressing and Concentration*.

Gold Milling

The Metallurgy of the Homestake Ore. Allan J. Clark and W. J. Sharwood. An outline of the present day treatment of the ore from the time it leaves the mine to the point at which it is discharged as residue. Ills. 29500 w. *Inst of Min & Met. Bul.* 98—Nov. 14, 1912. No. 37908 N.

Improvements at Lluvia de Oro Mill. H. R. Conklin. Describes the fine grinding and methods used at this gold and silver mine in Chihuahua, Mex. 2500 w. *Eng & Min Jour*—March 15, 1913. No. 40663.

Gold Ore

The Simplification of Gold Ore Treatment. A. W. Allen. Calls attention to the considerations involved and the probable advantages and disadvantages of a change of policy. 1700 w. *Min & Sci Pr*—Aug. 16, 1913. No. 44527.

Grinding

The Development of Fine Grinding in Connection with Gold Ore Treatment. Henry Hanson. The use of the tube mill as a fine grinder is considered. 1000 w. *Jour Can Min Inst*—Vol. XV. No. 42040 N.

Grading Analyses by Elutriation. H. Stadler. Describes elutriation apparatus and its use, explaining the theory. 3 plates. 4000 w. *Inst of Min & Met, Bul* 104—May 15, 1913. No. 43156 N.

Economical Fine Grinding in Pans. M. G. F. Söhnlein. Describes experiments with a grinding pan for producing fine material for concentrating. 1500 w. *Eng & Min Jour*—Sept. 27, 1913. No. 45497.

Hydrometallurgy

Hydrometallurgy. Regis Chauvenet. Discusses the difficulties met with in solution processes. 7000 w. *Met & Chem Engng*—Sept., 1913. No. 44966 C.

Consult Classification of the Index. See page 9.

Improvements

ORE DRESSING AND CONCENTRATION

Parkes Process

Improvements

Ore-Dressing Improvements. Robert H. Richards. Deals with the concentrating or ore-dressing problem and means of securing greater profit. 2000 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45466 F.

Iron Concentrators

Iron Ore Concentration in Minnesota. Illustrated description of the Trout Lake concentrating mill of the Oliver Iron Mining Co., Coleraine, Minn., and the Wisconsin Steel Co.'s mill at Nashwauk. 2000 w. Met & Chem Engng—Nov., 1912. No. 37250 C.

Progress in the Preparation of Iron Ores. J. W. H. Hamilton. Read before the Am. I. & St. Inst. Discusses recent developments in concentration, roasting, agglomeration, and other processes. 6500 w. Ir Age—Oct. 31, 1912. No. 37746 C.

Investigation of the Iron Melting Problem. A. W. Belden. Read before the Am. Found. Assn. An account of investigations at the U. S. research laboratory at Pittsburgh. 1800 w. Foundry—Nov., 1912. No. 37228.

Jigs

Jigging Unsize Ores. Edward T. Wright. Illustrates and describes present day milling methods. 2000 w. Met & Chem Engng—Nov., 1912. No. 37257 C.

Korea

Milling Plants of the Oriental Consolidated, Ulsan, Korea. A. E. Drucker. An account of the results secured through recent changes in construction. Ills. 2500 w. Min & Sci Pr—Nov. 23, 1912. No. 37916.

Melting

The Melting Furnace at Rio Plata Mill. Alvin R. Kenner. Illustrates and describes this charcoal-burning melting furnace. 800 w. Eng & Min Jour—March 15, 1913. No. 40665.

Milling

Milling in Southeastern Missouri. Claude T. Rice. Describes the ore in this lead district and the construction of the Doe Run No. 3 mill. Ills. 2200 w. Eng & Min Jour—June 21, 1913. Serial. 1st part. No. 43106.

Hardinge Mills vs. Chilean Mills. Robert Franke. A comparison, based on one and one-half years of operation in the same plant and under equal conditions, of the two types, with results in favor of the Hardinge mill. 3000 w. Bul Am Inst Min Engrs—July, 1913. No. 44012 F.

Milling Plants

The San Poil Mill, Republic, Wash. Edward C. Morse. Describes the plant and

its operation. 2000 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39449 F.

Building a Mill in Central America. R. B. Rogers. Illustrates and describes difficulties met in building a new plant near Tegueigalpa, Honduras. 3500 w. Min & Sci Pr—March 29, 1913. No. 41047.

Chosen Mining Company's Reduction Plant. J. D. Hubbard. Illustrated description of a reduction plant under construction in Korea. 1800 w. Min & Sci Pr—April 5, 1913. No. 41155.

Underestimating the Cost of Milling Plants. A. Sydney Additon. A study of the causes of underestimating, discussing mills and milling operations. 4000 w. Min & Sci Pr—July 19, 1913. Serial, 1st part. No. 43851.

Milling Practice

The Black Oak Mill. Charles H. Urquhart. Illustrated description of an all-sliming plant in California, which has proved successful. 3000 w. Min & Sci Pr—Nov. 30, 1912. No. 38039.

Mill Operation

Mill Physiology. Stephen L. Goodale. A discussion of difficulties in the operation of mills. 2500 w. Met & Chem Engng—Oct., 1913. No. 45779 C.

Mills

The Motherlode Mill, Salmo, B. C. C. Earl Rodgers. Illustrated description of a modern amalgamation-cyanidation mill. 2500 w. Eng & Min Jour—Sept. 20, 1913. No. 45262.

Nevada

Nevada Milling Practice. Alex. H. Martin. Describes present day milling practice as illustrated at four mills. 1500 w. Min Jour—Nov. 16, 1912. No. 37815 A.

Nevada Mill

Manhattan Ore Milling Co.'s Mill, Nevada. J. C. Kennedy. Gives the history and describes changes introduced. Ills. 2000 w. Min & Engng Wild—May 3, 1913. No. 41879.

Ore Testing

Principles and Methods of Ore Testing. I. F. Laucks. Explains the factors to be determined and outlines the methods of procedure. 4800 w. Eng & Min Jour—July 12, 1913. No. 43666.

A Simple Plant for Testing Efficiency. A. T. Tye. Describes a method of testing ores, as to concentrating qualities, in use for several years at Cananea. 2000 w. Min & Sci Pr—July 12, 1913. No. 43745.

Parkes Process

The Development of the Parkes Process in the United States. Ernst F. Eurich. Report of the development in

Consult Classification of the Index. See page 9.

Phosphate**ORE DRESSING AND CONCENTRATION**

Slimes

detail of this process for desilvering lead. 3500 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38875 F.

Phosphate

Phosphate Ore Dressing. Strauss L. Lloyd. Describes method of separating the ores from clays, etc., and process of roasting or drying. Ills. 1000 w. Mines & Min—Jan., 1913. No. 38715 C.

Precipitation

The Role of Certain Metallic Minerals in Precipitating Silver and Gold. Chase Palmer and Edson S. Bastin. Report of experimental investigations and results. 5000 w. Bul Am Inst of Elec Engrs—May, 1913. No. 42460 F.

Aluminum Precipitation at Nipissing. E. M. Hamilton. A statement of the reasons for adopting aluminum dust instead of zinc for precipitation, describing the process installed. 5000 w. Eng & Min Jour—May 10, 1913. No. 41959.

The Effect of Charcoal in Gold-Bearing Cyanide Solutions with Reference to the Precipitation of Gold. Morris Green. A report of experimental research work. 4000 w. Inst of Min & Met, Bul 109—Oct. 9, 1913. No. 46392 N.

Progress

Progress in Ore Dressing. Henry S. Munroe. Reviews improvements in hand sorting, storage and feeding of ore, crushing, sizing, classification, etc. 4500 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38931 C.

Recovery

Preparation of Ore Containing Zinc for the Recovery of Other Metals Such as Silver, Gold, Copper, and Lead by the Elimination and Subsequent Recovery of the Zinc as a Chemically Pure Zinc Product. S. E. Bretherton Describes work. 2500 w. Bul Am Inst of Min Engrs—Aug., 1913. No. 44746 F.

Reduction

Building a Reduction Plant. Herbert Lang. Discusses details of design, construction and arrangement. 5000 w. Min & Sci Pr—July 5, 1913. No. 43603.

Refractories

A Note on the Occurrence and Manufacture of Refractories in Montana. W. H. Gunniss. The manufacture of silica brick, and the fire clays. 700 w. Bul Am Inst of Min Engrs—Sept., 1913. No. 45468 F.

Melting Points of the Refractory Elements—I. Elements of Atomic Weight from 48 to 59. G. K. Burgess and R. G. Waltenberg. Deals with the iron group elements in the present paper. Ills. 2500 w. U S Bureau of Stand—No. 205. No. 45546 N.

Refractory Ore

A Research Upon a Refractory Gold Ore. Morris Green. Gives results of a series of researches, connected with the metallurgy of gold. A detailed investigation of a refractory ore found at the Mt. Morgan mine. 15000 w. Jour Chem, Met, & Min Soc of S Africa—Sept., 1912. No. 37625 E.

Republic, Wash.

Ore-Treatment at Republic, Wash. Francis A. Thomson. Reviews the history and production of the district, its geology, and the ore treatment. 3500 w. Bul Am Inst of Min Engrs—Jan., 1913. No. 39446 F.

Sampling

Ore Sampling Without Machinery. Jesse Scobey. A series of illustrations explaining the essential features of ore sampling. 1200 w. Met & Chem Engng—Feb., 1913. No. 39684 C.

Notes on Mine Sampling. G. C. Bateman. Suggestions for sampling and the method of taking and keeping the notes. 3000 w. Qr Bul of Can Min Inst—March 1913. No. 41602 N.

Adequate Sampling in Modern Mill Practice. Donald F. Irvin. Describes current practice at a mine where hand sorting, wet concentration, and cyanidation are employed. 3300 w. Min & Sci Pr—April 5, 1913. No. 41156.

Silver Milling

Nipissing High Grade Mill, Cobalt. R. B. Watson. Describes methods used with highly complex silver ore. Ills. 3000 w. Eng & Min Jour—Dec. 7, 1912. No. 38086.

Sintering

Laboratory Sintering. H. B. Pulsifer. Illustrates apparatus in the Armour Inst. of Technology, describing method of operating. Ills. 2000 w. Chem Engr—April, 1913. No. 41825 C.

See also Flue Dust, under *Iron and Steel*.

Slimes.

The Woodbury Slime Classifier. Edward T. Wright. A proposed method of milling by using plunger jigs on mixed feed not coarser than $\frac{3}{4}$ inch round. Ills. 1600 w. Mines & Min—Feb., 1913. No. 39628 C.

Continuous Decantation of Slime. Herbert A. Megraw. Explains a development of the old slime decanting system of cyanidation whereby the process is continuous through thickening machines. Ills. 1800 w. Eng & Min Jour—Feb. 15, 1913. No. 39873.

Continuous Agitation of Slime with Barren Cyanide Solution. C. F. Spaulding. Describes a mill to be built by the

Consult Classification of the Index. See page 9.

Smelter Contracts

ORE DRESSING AND CONCENTRATION

Tailings Disposal

Ogle Mountain Mining Co., in which the slime will be agitated by circulating barren cyanide solution instead of air. Flow sheet is given. 1800 w. Min & Sci Pr—March 1, 1913. No. 40324.

Evolution of Methods of Handling Slime. H. N. Spicer. Illustrated review of prevailing methods in different countries. The present article considers methods in vogue in India. 1500 w. Met & Chem Engng—April, 1913. Serial. 1st part. No. 41042 C.

Smelter Contracts

The Analysis of Smelter Contracts. Gelasio Caetani. Lecture at Harvard Univ. Gives an analysis and points out how much can be asked from the producer's viewpoint. 4000 w. Min & Sci Pr—May 10, 1913. Serial. 1st part. No. 42079.

Smelter-Fumes

Shasta County Smelter-Fume Problems. J. Nelson Nevins. From a report made to the Board of Directors of the Los Angeles Chamber of Mines and Oil. Information on both sides of the controversy. 2500 w. Min & Sci Pr—March 8, 1913. No. 40499.

Smelters

The Tootle Plant of the International Smelting & Refining Co. H. N. Thomson and L. T. Sieck. Illustrations and detailed description of equipment of this Utah smelter. 4400 w. Bul Am Inst Min Engrs—July, 1913. No. 44013 F.

Progress of Electric Smelting at Heroult, Cal. John Crawford. Report of the progress made at the first American electric iron ore reduction plant. Ills. 4500 w. Met & Chem Engng—July, 1913. No. 43486 C.

Smelting in Shaft Furnaces at Great Altitudes. Vicente Pazos y Sacio. Gives hints deduced from observation and proved by commercial results. 4000 w. Sch of Mines Qr—July, 1913. No. 43737 D.

Smelting

The Freeland Charging Machine. C. W. Renwick. Drawings and detailed description, with statement of claims of merit. 1500 w. Min & Sci Pr—March 22, 1913. No. 40838.

Organization of Smelting Enterprises. Herbert Lang. A study of the duties of the various officers is given in the present number. 2500 w. Min & Sci Pr—April 19, 1913. Serial. 1st part. No. 41614

A Five-Ton Smelting Furnace that Smelts. Clement H. Mace. Illustrated description of the Partridge furnace. 1200 w. Eng & Min Jour—May 3, 1913. No. 41860.

Smelting Precipitate at Cerro Prieto, Sonora. H. S. Munroe. Describes the process of refining the precipitate from an early installation where zinc dust was used as a precipitant. 2500 w. Eng & Min Jour—June 7, 1913. No. 42705.

Semi-Pyritic Smelting in Mexico. R. Stephen Pratt. By following pyritic-smelting methods the coke consumption was reduced to less than 4%. 1200 w. Eng & Min Jour—June 14, 1913. No. 42833.

Nickel Smelting by the Mond Process. A. P. Coleman. Excerpt from "The Nickel Industry" Bul. 170, Can. Dept. of Mines. Illustrated description of the new smelting plant near Coniston, and the operation. 4500 w. Min & Sci Pr—Sept. 13, 1913. No. 45241.

Sorting

Milling vs. Hand Sorting of Lead Ore. R. S. Handy. Describes the ore-crushing department at Kellogg, Idaho, giving tests and data. 1500 w. Min & Sci Pr—March 15, 1913. No. 40724.

Sorting Plant

Nipissing Picking and Jigging Plant, Cobalt, Ont. Reginald E. Hore. Describes a plant in operation in 1912, and the results. Ills. 1200 w. Can Min Jour—June 15, 1913. No. 42988.

Stamp Milling

Stamp Milling in 1912. Louis D. Huntton. Brief review. 1000 w. Eng. & Min Jour—Jan. 11, 1913. No. 38990.

Stamp-Mills

The Pinder-Berry Stamp-Mill. S. L. Berry. Describes this mill and states the advantages claimed. Ills. 1500 w. Min & Sci Pr—May 17, 1913. No. 42303.

Winona Stamp-Mill. R. B. Seeber. Illustrated detailed description of this plant and its operation for the extraction of copper from low-grade ore. 3500 w. L Superior Min Inst—Aug. 26, 1913. No. 44586 N.

Mill Construction and Estimates of Costs. A. M. Merton. Discusses generally the causes for underestimates and gives data on a 10-stamp mill. 2000 w. Min & Engng Wld—Oct. 11, 1913. Serial. 1st part. No. 45818.

Tailings

Roasting and Leaching Tailings at Anaconda, Mont. Frederick Laist. Plans and description of equipment and results of recent tests. Ills. 4000 w. Bul Am Inst Min Engrs—July, 1913. No. 44007 F.

Tailings Disposal

Disposal of Tailing at El Tigre, Sonora. Donald F. Irvin. Illustrated description of the slime dam for tailing storage, the long ditch used to convey the

Consult Classification of the Index. See page 9.

Thiogen Process

tailing and the method of operating. 1500 w. *Min & Sci Pr*—Dec. 7, 1912. No. 38166.

Thiogen Process

Present status of the Thiogen Process. S. W. Young. Discusses this process for the elimination of sulphur dioxide from smelting fume. 1600 w. *Eng & Min Jour*—Feb. 15, 1913. No. 39872.

Tin Milling

Magnetic Dressing of Tin Ores. J. B. Van Brussel. Describes new methods introduced in England, comparing with old method. Ills. 1200 w. *Eng & Min Jour*—Nov. 23, 1912. No. 37765.

Treatment Waters

See Clarification, under **CIVIL ENGINEERING**, *Water Supply*.

RARE MINERALS**Iridium****Tube Mills**

Selection and Operation of Tube Mills. A. M. Merton. Discusses important points in order to secure the best results. 2000 w. *Min & Engng Wld*—June 14, 1913. No. 42856.

Volatilization

Extraction by Volatilization. Information concerning the Howe process. 1700 w. *Aust Min Stand*—Aug. 28, 1913. No. 45726 B.

Waste

Handling Material in Labor Wasting Mills. S. A. Worcester. Criticism of mills using manual labor where simple automatic devices would be a great saving, and calls attention to power wastes. 1800 w. *Min & Sci Pr*—March 29, 1913. No. 41049.

RARE MINERALS**Amber**

Recovery and Treatment of Amber at Palmnicken (East Prussia). Abstract from *Glückauf*. Information concerning the amber-producing industry. 1500 w. *Min Jour*—July 26, 1913. No. 44170 A.

Diamonds

The Origin of Alluvial Diamonds. David Draper. Discusses the theories advanced to account for them, their origin, etc. 3500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37843 N.

Earliest Discoveries of Diamonds in Cape Colony and the Transvaal. David Draper. Brief account of early discoveries. 1500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37846 N.

Early Days on the Diamond Fields. Theodore Reunert. A hitherto unpublished document telling the story of the earliest operations. Ills. 3500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37856 N.

The Great Diamond Industry of South Africa. Harold S. Harger. History of the progress of De Beers, Premier, and other diamond producers. Ills. 7500 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37859 N.

Mining Methods at Kimberley. John T. Fuller. Describes methods used in mining diamond bearing rock. Ills. 4000 w. *Eng & Min Jour*—Nov. 9, 1912. Serial 1st part. No. 37363

Development of Diamond Recovery Methods in German South-West Africa. Dr. Joh. E. Barnitzke. An account of early methods and improvements introduced, describing the Shiechel separator and other mechanical devices. 2500 w.

S African Min Jour—Sept., 1912. (Special.) No. 37861 N.

Premier Diamond Mine. Ralph Stokes. Illustrated account of the nature of the deposit, the mining methods, etc. 6000 w. *Min Mag*—Nov., 1912. No. 37907 B.

Prospecting and Washing for Diamonds. W. J. Dick. Describes methods of diamond washing that may be satisfactorily employed by the prospector. Ills. 1200 w. *Qr Bul of Can Min Inst*—March, 1913. No. 41600 N.

The Exploitation of the Diamond Fields of Southern Africa (*L'exploitation des gisements diamantifères de l'Afrique australe*). Jean Escard. A review of diamond mining methods in this region. Ills. 5400 w. *Genie Civil*—June 14, 1913. No. 43088 D.

The German West African Diamond Fields. Information from a recent consular report of the conditions and production during 1912. 2500 w. *Min Jour*—July 26, 1913. No. 44171 A.

See also South Africa, under *Gold and Silver*.

Gems

Synthesis of Precious Stones. I. H. Levin. Read before the N. Y. Sec. of the Am. Chem. Soc. Traces the development of the production of diamonds, emeralds, rubies, and sapphires. 4000 w. *Chem Engr*—Aug., 1913. No. 44802 C.

Iridium

Iridium in American Placer Platinum. Frederick W. Horton. Discusses the possibilities of an iridium supply in the United States. Ills. 2500 w. *Eng & Min Jour*—Nov. 9, 1912. No. 37362.

Consult Classification of the Index. See page 9.

Lithium

Iridium. E. de Hautpick. Information concerning this metal, its value, applications, etc. 3000 w. *Min Jour*—Feb. 1, 1913. No. 39779 A.

Lithium

Lithium. Amil A. Anderson. From the *Pahasaps Qr.* Describes the forms in which it occurs, its uses, methods of determination, and processes of extraction. 2200 w. *Mines & Min*—Dec., 1912. No. 38012 C.

Nova Scotia

The Sheelite Deposits of Nova Scotia. Victor G. Hills. Illustrates and describes these deposits in the Moose River Gold Mining District. 1200 w. *Jour Can Min Inst*—Vol. XV. No. 42052 N.

Pitchblende

Pitchblende From Quartz Hill, Gilpin County, Colorado. Forbes Rickard. Describes the geology of the district, the ore deposits, and the high quality pitchblende, known to be more radio-active than any others found. Ills. 3500 w. *Min & Sci Pr*—June 7, 1913. No. 42800.

Platinum

Platinum: the Most Precious of the Metals. Harry F. Keller. The history of the metal, the mineralogy, extraction, purification, properties, uses, production and value. Ills. 6500 w. *Jour Fr Inst*—Nov., 1912. No. 37542 D.

Some Notes on the Analysis of Platiniferous Minerals (Quelques Mots sur l'Analyse du Minerai de Platine). E. V. Koukline. Describes various methods for making such analyses. 4500 w. *Rev de Metall*—Oct., 1912. No. 37499 H.

Platinum in British Columbia. Frank Bailey. Remarks on the uses of this rare metal, and information concerning deposits on the Similkamecu and Tulameen Rivers and other parts of British Columbia. Ills. 4500 w. *Min Jour*—March 1, 1913. No. 40476 A.

Causes of Error in Platinum Tests (Die Fehlerquellen der Platinprobe). L. St. Rainer. Sources of error in chemical analyses of platinum. Diagrams. Serial. 1st part. 3500 w. *Oest Zeit für Berg- u Hütten*—March 15, 1913. No. 41422 D.

Occurrence of Platinum in the Urals. E. de Hautpick. A geological description of the deposits of platinum found in the Urals platinum placers. 1500 w. *Min Jour*—Sept. 20, 1913. No. 45562 A.

See also Iridium, under *Rare Minerals*, and Alloys, under *MECHANICAL ENGINEERING, Materials of Construction*.

Queensland

Rare Metal Mining in Queensland. Lionel C. Ball. A résumé of recent field studies on wolfram, molybdenite and bis-

RARE MINERALS

muth ores. Ills. 3500 w. *Queens Gov Min Jour*—Jan. 15, 1913. No. 40113 B.

Radium

Halos in Minerals. J. Joly. Considers markings due to radium in rocks, and their significance. Ills. 8000 w. *Sci Am Sup*—March 1, 1913. No. 40295.

The Uranium and Radium Situation. Charles L. Parsons. Shows that ores of great value are being shipped out of the country and manufactured into marketable condition in foreign countries. 1500 w. *Min & Sci Pr*—May 17, 1913. No. 42304.

Rhodesia

Rare Minerals at Broken Hill, Rhodesia. George D. Hubbard. Description of rare and beautiful minerals found in Rhodesia in association with a deposit of animal bones. 1600 w. *Eng & Min Jour*—June 28, 1913. No. 43308.

Sapphires

Notes on the Anakee Sapphire Fields in 1913. Lionel C. Ball. Brief account of the development, with illustrated description of the mining methods, treatment, etc. 3000 w. *Queens Gov Min Jour*—May 15, 1913. No. 43165 B.

Tellurium

The Arc Spectrum of Tellurium. H. S. Uhler and R. A. Patterson. Gives an account of the results of experimentation upon the arc spectrum of tellurium, and a record of the wave-lengths of the arc lines on the basis of the international system. 2500 w. *Am Jour of Sci*—Aug., 1913. No. 44378 D.

Tungsten

A Tungsten Mine in Nova Scotia. V. G. Hills. Describes the geology, the deposits and development. Ills. 2200 w. *Min & Sci Pr*—March 22, 1913. No. 40839.

Notes on Tungsten Mining in Nova Scotia. Victor G. Hills. Treats of these deposits and the methods of mining and milling, especially wherein they differ from Colorado. 1500 w. *Min & Engng Wld*—March 1, 1913. No. 40299.

Wolfram Mines at Mount Carbine. Lionel C. Ball. Map and illustrated notes giving the history, location, geography, physiography, geology, ore deposits, etc. 14800 w. *Queens Gov Min Jour*—Feb. 15, 1913. Serial. 1st part. No. 40812 B.

Uranium

Uranium: Its Discovery, Chemical Composition and Uses. J. H. Harris-James. 1200 w. *Jour Soc of Arts*—Nov. 1, 1912. No. 37386 A.

Wolframite

Wolframite in Portugal. F. Brouckart. Trans. from *Ann. de la Soc. Geol de Belgique*. Describes the general aspect of the wolframite-bearing zone, the minerals

Zircon

associated, general characteristics, etc. 2000 w. *Min & Sci Pr*—Dec. 14, 1912. No. 38308.

Zircon

Properties, Occurrence and Uses of Zircon Thomas A. Watson and Frank

MISCELLANY

Brazil

L. Hess. Abstract from *Bul. of Univ. of Va.* Information concerning mode of occurrence, rock associations, uses, etc. 4000 w. *Min & Engng Wld*—Nov. 23, 1912. No. 37781.

MISCELLANY

Address

The President's Annual Address. Samuel A. Taylor. An address to the Am. Min. Cong. on the problems and conditions which exist in the mining industry to-day. 4000 w. *Pro Am Min Cong*—1912. No. 46176 N.

Africa

Mining in the Territory of the Companhia de Mocambique. Austin King. Illustrated review of the history and description of the characteristics of the region. 4000 w. *S African Min Jour*—Sept., 1912. (Special.) No. 37850 N. Journeys in Nigeria. J. B. Richardson. Gives a mining engineer's experiences, with illustrations by himself. 3500 w. *Mining Mag*—Jan., 1913. Serial. 1st part. No. 39432 B.

Mining in the Belgian Congo in 1912. Sydney H. Ball. A review of the more important developments, with report of production; the copper industry in Katanga; the placer gold industry; diamond and tin discoveries. Ills. 5000 w. *Min & Sci Pr*—April 19, 1913. No. 41613.

Agricola

Agricola: An Appreciation. F. Lynwood Garrison. Interesting review of this early text-book on mining. Ills. 3500 w. *Min & Sci Pr*—Aug. 9, 1913. No. 44362.

Alaska

Mineral Production of Alaska in 1912. Alfred H. Brooks. Information from advance chapter of the Mineral Resources of the U. S. 4500 w. *Min & Engng Wld*—Aug. 23, 1913. No. 44578.

Report of the Mine Inspector for the Territory of Alaska for the Fiscal Year Ended June 30, 1912. 24 pp. U S Dept of Interior—No. 42485 N.

Government Construction of Railroads and Leasing of Coal Lands. Falcon Joslin. A discussion of the policy in regard to Alaska and its effect on the development of the country. 7500 w. *Pro Am Min Cong*—Nov. 25-29, 1912. No. 44063 N.

A "Day-in-Court" for the Alaska Coal Claimants. Maurice D. Lehey. A criticism of the government policy. 4000 w. *Pro Am Min Cong*—Nov. 25-29, 1912. No. 44064 N.

Law Enforcement for Alaska. George E. Baldwin. A criticism of the scheme of conservation in Alaska as carried on to date. 2500 w. *Pro Am Min Cong*—Nov. 25-29, 1913. No. 44065 N.

Law Enforcement in Alaska. George E. Baldwin. An account of injustice in Alaska affairs and the problems retarding the development. 2500 w. *Pro Am Min Cong*—1912. No. 46182 N.

See also Alaska, under *Coal and Coke*, and same heading under *RAILWAY ENGINEERING, Miscellany*.

Ancient Mines

Ancient Mine-Workings. T. Lane Carter. Drawings and description of old workings and old methods. 2500 w. *Mining Mag*—Jan., 1913. No. 39434 B.

Australasia

Review of Australasian Mining in 1912. Reviews eastern and western Australia and New Zealand. Maps. 6500 w. *Min & Sci Pr*—Jan. 16, 1913. No. 39179.

State Aid to Mining in Australasia. H. Mortimer Lamb. Concerning some of the methods employed in Australasia to encourage the mining industry. 3500 w. *Qr Bul of Can Min Inst*—March, 1913. No. 41596 N.

Austria

Mine Output in Austria During 1911 (*Die Bergwerksproduktion Oesterreichs im Jahre 1911*). Statistics by districts of the production of gold, silver, iron, tin, sulphur, coal, etc. Serial. 1st part. 2400 w. *Oest Zeit f Berg u Hüttenwesen*—Dec. 21, 1912. No. 39003 D.

Bohemia

The History of Mining in Bohemia (*Zur Geschichte des Bergbaues in Böhmen*). Dr. Fleck. Brief account of mining development from the middle ages to the present. 4500 w. *Glückauf*—July 19, 1913. No. 44617 D.

Bolivia

The Minerals of Bolivia. Discusses the condition of the mining industry, the metals produced, and the various ores and their occurrence. Map. 3000 w. *Eng & Min Jour*—Oct. 4, 1913. No. 45670.

Brazil

Laterization in Minas. Geraes, Brazil. J. H. Goodchild. A discussion of the laterite problem. Processes taking place

Consult Classification of the Index. See page 9.

British Columbia

in outcrops of iron-drenched materials known as canga and itabirite and in the associated rocks. Ills. 7000 w. Inst of Min & Met, Bul 109—Oct. 9, 1913. No. 46390 N.

British Columbia

The Mining Regions of Southern British Columbia. Arthur Lakes. Illustrated description of the region, ore deposits, water power, timber, etc. 2000 w. Min & Engng Wld—Dec. 28, 1912. No. 38691.

Mining in Lynn Creek District, British Columbia. Newton W. Emmens. Describes a district about ten miles north of Vancouver, the kinds of ores found, occurrence, development, etc. Ills. 1500 w. Min & Engng Wld—Feb. 15, 1913. No. 39870.

Typical or Peculiar Mines of British Columbia. Arthur Lakes. Drawings and description of the Ainsworth mining district, and mines. 1500 w. Min & Engng Wld—March 15, 1913. No. 40668.

Bulgaria

Notes of Some Bulgarian Mineral Deposits. Herbert K. Scott. Map and account of the principal mineral deposits, history of the mines, and related information. 7000 w. Inst of Min & Met, Bul 103—April 10, 1913. No. 41690 N.

Bureau of Mines

Second Annual Report of the Director of the Bureau of Mines to the Secretary of the Interior for the Fiscal Year Ending June 30, 1912. Explains the purpose of the Bureau of Mines (U. S.), describing its work, its needs, investigations, administration, etc. 88 pp. U S Bureau of Mines—Jan., 1913. No. 40413 N.

Canada

The Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and Other Metals in Canada During the Calendar Year 1911. Cosmo T. Cartwright. Advance chapter of the annual report on the mineral production of Canada. 85 pp. Can Dept of Mines—No. 199. No. 39541 N.

Summary Report of the Mines Branch of the Department of Mines for the Calendar Year Ending December 31, 1911. Report of progress for the year, field work, laboratory work, etc. Maps, and Ills. 208 pp. Can Dept of Mines—No. 142. No. 39546 N.

A General Summary of the Mineral Production of Canada During the Calendar Year 1911. John McLeish. 13000 w. Can Dept of Mines—No. 183. No. 39540 N.

A General Summary of the Mineral Production of Canada During the Calendar Year 1911. John McLeish. 38 pp. Can Dept of Mines—No. 183. No. 41708 N.

MISCELLANY

A General Summary of the Mineral Production of Canada During the Calendar Year 1912. John McLeish. 46 pp. Can Dept of Mines—No. 238. No. 46389 N.

Mining and the Canadian Northern Railway. Deals with the relation of mining to the growth of this railway. Map and Ills. 2500 w. Can Min Jour—June 1, 1913. No. 42689.

Preliminary Report of the Mineral Production of Canada, 1912. Statistics, subject to revision. 10000 w. Can Min Jour—March 15, 1913. No. 40725.

Economic Minerals and Mining Industries of Canada. A sketch of the more important economic minerals and of the mining and metallurgical industries, giving particulars and statistics from official sources. Ills. & Maps. 77 pp. Can Dept of Mines—No. 230. No. 46388 N.

A Visit to Mines of Alberta and British Columbia. Reginald E. Hore. An account of visits to the coal mines of Alberta and the coal, gold and copper mines of British Columbia. Ills. 2000 w. Can Min Jour—Oct. 1, 1913. Serial, 1st part. No. 45691.

Colorado

Progress in Colorado Mining and Milling. W. H. Graves. Considers the improved mining methods and economy, better mill extraction and other features of progress. Ills. 1200 w. Min & Engng Wld—March 29, 1913. Serial. 1st part. No. 40969.

Columbia

The Metal and Mineral Resources of Columbia. Isaac A. Manning. Information from Consular Reports concerning the copper deposits, gold, iron, and coal, silver, oil, and asphalt. 1500 w. Min & Engng wld—Feb. 22, 1913. No. 39987.

Conservation

Our National Resources and Our Federal Government. Continued discussion of the paper of R. W. Raymond. 4000 w. Bul Am Inst of Min Engrs—May, 1913. No. 42468 F.

Court Decision

Smuggler-Union and Liberty Bell Case. R. W. Raymond. Review of the decision of the higher court. 3000 w. Eng & Min Jour—June 14, 1913. No. 42835.

Cripple Creek

Leasing and Low-Grade Milling at Cripple Creek. Stephen L. Goodale. An account of present conditions and the success of the leasing system and the means of treating low-grade ores. Ills. 2500 w. Min & Sci Pr—Aug. 23, 1913. No. 44801.

Crystallography

Scientific Conclusions on the Crystallography of Metals (Technologische

Crystallography

Dutch Indies

Schlüsse aus der Kristallographie der Metalle). W. v. Moellendorff and J. Czochralski. A resumé of the conclusions drawn by various scientists of the period. Plates. Serial, 1st part. 4500 w. Zeit des Ver deutscher Ing—June 14, 1913. No. 43529 D.

Dutch Indies

The Discovery of Minerals in the Dutch-Indies (Opsporing van delfstoffen in Nederlandsch-Indië). E. Middelberg. Contributions to the study of the resources of Dutch-India and criticisms to the articles by Dr. H. G. Jonker, appearing June, 1912. 4000 w. De Ingenieur—Oct. 5, 1912. No. 37479 D.

The Discovery of Minerals in the Dutch-Indies (De opsporing van delfstoffen in Nederlandsch-Indië) H. J. E. Wenckelbach. Further criticisms on Dr. Jonker's articles. 2700 w. De Ingenieur—Oct. 19, 1912. No. 37480 D.

Egypt

Agricultural and Mineral Resources of Egypt (La Richesse agricole et minérale e l'Egypte). M. Poller. Describes the vast benefit derived from irrigation systems, especially in cotton production, and reviews the mineral production from the Soudan. 20,000 w. Bull Soc d'Encour—Oct., 1912. No. 37496 E + F.

Fritz, John

Biographical Notice of John Fritz. Rossiter W. Raymond and Henry Sturgis Drinker. A review and an appreciation. Photograph. 6000 w. Bul Am Inst of Min Engrs—June, 1913. No. 43249 F.

Geology

Geodetic Inspection of the Tectonic Movements in the Ore Deposits of Pribram (Geodätische Untersuchung über die tektonischen Bewegung auf der Erz-lagerstätte von Pribram). Franz Köhler. The extent of the survey, and the instruments and methods adopted. Ills. Serial, 1st part. 1700 w. Oest Zeit f Berg u Hütten—April 19, 1913. No. 42121 D.

Georgia

Development of Mines and Quarries of Georgia. S. W. McCallie. Illustrates and describes some of the important minerals of the state which have been more or less developed. 2500 w. Mfrs' Rec—Dec. 12, 1912. No. 38157.

Germany

The Admiral Mining Plant at Hörde (Die Bergwerksanlage Admiral bei Hörde). Herr Baum. Detailed description of mining operations. Ills. 5600 w. Glückauf—Nov. 30, 1912. No. 38422 D. Mining in the Grand Duchy of Baden (Der Bergbau im Grossherzogtum Baden). M. Henglein. A review of the mineral production of the region taken

MISCELLANY

by valleys. Maps. Serial, 1st part. 3600 w. Glückauf—June 14, 1913. No. 43514 D.

Holland

A Visit to the State Mines in Limburg (Inleiding tot het bezoek aan de Staatsmijnen in Limburg). R. de Kat. General description of the district, with plans of workings, shaft-houses, dwellings, etc. Ills. 5400 w. De Ingenieur—July 26, 1913. No. 44696 D.

Hot Springs

The Hot Springs and the Mineral Deposits of Wagon Wheel Gap, Colorado. W. H. Emmons and E. S. Larsen. Notes based on a hasty visit to the springs, describing the springs and their associated universal deposits. Ills. 4000 w. Ec-Geol—April-May, 1913. No. 42323 D.

Idaho

Mining Operations in Idaho During 1912. Robert N. Bell. Information from the annual report. Ills. 1800 w. Min & Engng Wld—March 8, 1912. No. 40381.

Investors

The Protection of Investors in Mining Stocks. W. H. Storms. Thinks drastic legislation is needed to protect the public from the wiles of promoters. 1500 w. Pro Am Min Cong—1912. No. 46178 N.

Japan

The Mines of Mitsu Bishi Goshi-Kwaika, Japan. An illustrated account of the property of this company and its development. 4500 w. Min & Engng Wld—Nov. 23, 1912. No. 37779.

Korea

A Trip Through Northern Korea. Henry W. Turner. Gives notes taken in the autumn of 1910. Information concerning the geology of the region traversed. Ills. 3000 w. Bul Am Inst of Min Engrs—April, 1913. No. 41658 F. Work of the Seoul Mining Company. Korea. Information from a recent report concerning the mines, ores, power requirements, and milling results. Map. 2000 w. Min & Sci Pr—June 7, 1913. No. 42801.

Lake Superior

Living Conditions on the Lake Superior Ranges. Illustrated account of how the Iron Mining Co.'s establish towns, provide homes and generally care for the welfare of their employees. 1200 w. Ir Trd Rev—Jan. 23, 1913. No. 39317.

Land Classification

Land Classification: Its Basis and Methods. W. B. Heroy. Discusses the classification of public lands with relation to water supply, domestic use, irrigability, water power value, etc. 8000 w. Ec-Geol—June, 1913. No. 42949 D.

London

London

A Year in the London Mining Market. T. A. Rickard. A review of the Transvaal, Rhodesia, West Africa, Australasia, America, India, Russia, and other countries. Maps. 5500 w. Min & Sci Pr—Jan. 4, 1913. (Special.) No. 38922 C.

Madagascar

Some of the Mineral Products of Madagascar (Notice sur quelques produits miniers de Madagascar). F. Bonnefond. A brief account of some ores found. Maps. 2800 w. Mem Soc Ing Civ de France—Jan., 1913. No. 42169 G.

Malay States

Mining in the Federated Malay States. D. C. Alexander, Jr. Report, with special reference to methods and equipment. Ills. 25 pp. U. S. Bureau of Mfrs—No. 59. No. 41717 N.

Manitoba

Manitoba's Minerals. R. C. Wallace. Brief discussion of the resources known and the advisability of initiating a policy of development. 1500 w. Can Engr—Feb. 13, 1913. No. 39825.

Manitoba's Minerals. Dr. R. C. Wallace. Reviews what is known of the mineral resources. Gypsum, clay products, granite, limestones and gold have been found. 1400 w. Archt, Lond—Oct. 3, 1913. No. 45832 A.

Metallurgy

Present Limitations of Metallurgical Processes. F. W. Traphagen. Abstract of a paper read before the "Technick" Club, Denver, Colo. Calls attention to improvements needed in metallurgical practice. 1500 w. Min & Engng Wld—Feb. 1, 1913. No. 39640.

Metal Production

Production and Consumption of the Heavy Metals (Erzeugung und Verbrauch der wichtigsten Metalle). Statistics on the production and use of lead, copper, zinc and tin in Europe and America within the past three years. 7000 w. Glückauf—Sept. 13, 1913. No. 45389 D.

Mexico

Mineral Resources of San Luis Potosi, Mex. Wilbert L. Bonney. Silver is the chief product, but gold, lead, copper, antimony, salt, sulphur, quicksilver, and zinc are produced. Tin and iron deposits have been located. 2000 w. Min & Engng Wld—April 12, 1913. No. 41201.

Properties of Mines Company of America. Charles Biesel. Information from the annual report of mines in northern Mexico. Map. 5000 w. Min & Sci Pr—June 14, 1913. No. 42937.

The Mines of Mexico. Herbert A. McGraw. A discussion of present condi-

MISCELLANY

Natural Resources

tions and the future outlook. Ills. 2500 w. Engineering Magazine—Oct., 1913. No. 45541 B.

A New Occurrence of Silver, Copper, and Cobalt Minerals in Mexico. Frank R. Van Horn. Describes minerals found at Veta Rica mine, Coahuila, Mexico. Ills. 2500 w. Am Jour of Sci—Jan., 1913. No. 39435 D.

Progress in Mexico in 1912. A review of the year's production and developments in mining. Map. 3500 w. Min & Sci Pr—Jan. 11, 1913. No. 39180.

Microscopy

A Scheme for Utilizing the Polarizing Microscope in the Determination of Minerals of Non-Metallic Lustre. A. J. Moses. Describes tests used and gives tables. 6000 w. Sch of Mines Qr—July, 1913. No. 43735 D.

Mineral Lands

The Federal Government and Mineral Lands. W. C. Mendenhall. Excerpts from a paper read before the Calif. Miners' Assn. Discusses the subject of public land administration. 4500 w. Min & Engng Wld—Dec. 21, 1912. No. 38355.

Mineralogy

The Paragenesis of Minerals. Austin F. Rogers. Discusses the different senses in which the term paragenesis is used, paragenetic varieties, etc. 3000 w. Ec-Geol—Oct.-Nov., 1912. No. 38501 D.

Transformations and Chemical Reactions in Their Application to Temperature Measurements of Geological Occurrences. Joh. Koenigsberger. A study of geological temperature determinations. Ills. 11500 w. Ec-Geol—Oct.-Nov., 1912. No. 38504 D.

Mining Congress

Report of the Proceedings of the Fifteenth Annual Session of the American Mining Congress. Reports of meeting at Spokane, Washington, Nov. 25-29, 1912. 124 pp. Pro Am Min Cong—1912. No. 46175 N.

Mining Industry

The President's Annual Address. Samuel A. Taylor. Discusses some of the problems and conditions which exist in the mining industry, and the solution for some of them. 4000 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44059 N.

Mining Stocks

The Protection of Investors in Mining Stocks. W. H. Storms. Shows the need of more drastic legislation. 1500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44061 N.

Natural Resources

The Disposition of Natural Resources. George Otis Smith. Considers needed reforms in legislation affecting the disposi-

Consult Classification of the Index. See page 9.

Nevada

tion of public lands. 2500 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46348 F.

The National Forests and Development of Natural Resources. Henry S. Graves. Considers that their control should be the care of the nation and not of States or private individuals. 4000 w. Pro Am Min Cong—1912. No. 46177 N.

Nevada

The Kennedy Mining District, Nevada. Paul Klopstock. Gives the history, geology, character and value of ores, ore treatment, etc. 2500 w. Bul Am Inst of Min Engrs—June, 1913. No. 43256 F.

New Mexico

The Geologic and Structural Relations at Santa Rita (Chino), New Mexico. Sidney Paige. Describes the important features of the region and gives a table showing the relation of ore formation. Map. 4000 w. Ec-Geol—Sept., 1912. No. 37671 D.

New York

Mining in Northern New York. P. B. McDonald. An illustrated account of the mines, the variety of minerals, the geology, economic conditions, etc. 2500 w. Eng & Min Jour—April 5, 1913. No. 41110.

Nova Scotia

Notes from the Annual Report of the Department of Mines of Nova Scotia. Report of mineral production for year ending Sept. 30, 1912. 2500 w. Can Min Jour—March 15, 1912. No. 40726.

Oil Refinery

Standard Oil Co.'s Big Refinery at Richmond, Cal. Illustration and description of the plant for treating asphaltic oils. 1000 w. Min & Engng Wld—Nov. 30, 1912. No. 37955.

Ore Deposits

Ore Deposits of the Kirkland Lake District. Charles Spearman. A summary of surface observations. The mineralization consists of quartz, molybdenite, graphite, pyrite, gold and tellurides of lead, silver and gold. 1600 w. Can Min Jour—Oct. 1, 1913. No. 45690.

Philippines

Ore Deposits of the Philippine Islands. F. T. Eddingfield. Discusses the geology, mineral springs, gold ore veins, placers, etc. Ills. 6000 w. Philippine Jour of Sci—April, 1913. No. 44055 N.

Production

The Economic Progress of Metals Other Than Iron in 1910 (Mouvement économique des Métaux autres que le Fer en 1910). M. Reberyl. Gives production statistics and prices on copper, lead, zinc, tin, nickel, aluminum, and antimony. Di-

MISCELLANY

South Dakota

agrams. 10500 w. Rev de Metall—Oct., 1912. No. 37500 H.

World's Production of Principal Metals. Investigates the rate of increase in the production of copper, iron, lead and zinc for the last forty years. 1000 w. Eng & Min Jour—April 12, 1913. No. 41188.

Mining in Foreign Countries in 1912. General Review of the different countries, indicating satisfactory conditions in all countries but Mexico. 50000 w. Min & Engng Rev—Jan. 25, 1913. No. 39422.

Public Lands

Federal Administration of the Public Lands. W. C. Mendenhall. Abstract of an address prepared for the California Miners' Assn. 3500 w. Min & Sci Pr—Jan. 4, 1913. Serial. 1st part. (Special.) No. 38926 C.

Queensland

Queensland Mining Industry. Report of the under secretary for mines, reviewing the year 1912. 21800 w. Queens Gov Min Jour—March 15, 1913. No. 41609 B.

Review of 1912

The Mineral Production of the Lower Rhine-Westphalian Districts in 1912 (Die Bergwerksproduktion des nieder-rheinisch-westfälischen Bergbaubezirks im Jahre 1912). Ernest Jüngst. Tonnage production and revenues by districts compared with previous year. 8000 w. Glückauf—April 26, 1913. No. 42120 D.

Rock Components

The Determination of the Relative Volumes of the Components of Rocks by Mensuration Methods. Francis Church Lincoln and Henry Lewis Rietz. Briefly outlines and compares all methods employed and describes in detail the mensuration methods. 5000 w. Ec-Geol—March, 1913. No. 41279 D.

Russia

Russia in 1912. E. de Hautpick. Reviews the mining industry, the production and progress in gold mining, copper, manganese, iron, coal, and petroleum. 8000 w. Min Jour—Jan. 4, 1913. No. 39148 A.

South America

Mining on the West Coast of South America. Howland Bancroft. An account of present conditions in the republics of the West Coast. Ills. 3000 w. Min & Sci Pr—Jan. 25, 1913. No. 39577.

Mining in South America in 1912. Reports from the different countries of S. A. Maps. 3000 w. Eng & Min Jour—Jan. 11, 1913. No. 38994.

South Dakota

Mining and Milling in the Black Hills, S. D. Jesse Simmons. The district is

Consult Classification of the Index. See page 9.

Southern States

noted for its diversified mineral resources, principally the previous metals and coal, and has a reputation for cheap mining and milling methods. Ills. 1200 w. *Min & Engng Wld*—April 5, 1913. Serial. 1st part. No. 41077.

Southern States

The Mineral Industry of the Southern States Geographically Distributed. Edward W. Parker. Information concerning the principal mining industries and report of the output. 6000 w. *Mfrs' Rec*—Feb. 13, 1913. No. 39821.

The Mineral Assets of the South. Dr. David T. Day. Information concerning their value, and extent. Ills. 3500 w. *Mfrs' Rec*—March 27, 1913. (Special.) No. 41550 N.

Sulphuric Acid

The Falding Sulphuric Acid Chamber. Explains the theory of the Falding system, illustrating plants. 1000 w. *Eng & Min Jour*—Feb. 8, 1913. No. 39738.

Tunis

The Mineral Treasures of Tunis (Die Mineralschätze Tunesiens). H. Arlt. A geological study of the country; the location and kinds of ores produced. Serial. 1st part. 2800 w. *Glückauf*—July 19, 1913. No. 44616 D.

Turkestan

Mining Possibilities in Turkestan. Algernon Noble. Information concerning coal, oil and copper mining in this Asiatic region. Map and Ills. 1700 w. *Mining Mag*—Dec., 1912. No. 38635 B.

MISCELLANY

Wisconsin

United States

Mining in the United States in 1912. The mining activities of the different states are reviewed by well informed writers, and show unusual prosperity and progress. 114000 w. *Min & Engng Rev*—Jan. 25, 1913. No. 39421.

The Geographical Distribution of Mining Development in the United States. Edward W. Parker. Information concerning the mineral products and their distribution. 2200 w. *Bul Am Inst of Min Engrs*—March, 1913. No. 40898 F.

Mineral Production of the Central States in 1912. J. P. Dunlop. Information from Mineral resources of the U. S. 1500 w. *Min & Engng Wld*—July 19, 1913. No. 43794.

Metal Mining. Ervin W. McCullough. A short historical sketch of the mining industry in the United States and its importance in shaping the destiny of the nation. 2500 w. *Jour Assn of Engng Socs*—Sept., 1913. No. 45450 C.

Virginia

Mineral Resources of Virginia. Thomas Leonard Watson. Information concerning the amount of production, variety of minerals, etc. 2000 w. *Min & Sci Pr*—June 14, 1913. Serial. 1st part. No. 42936.

Wisconsin

The Mineral Industry of Wisconsin. Edwin C. Holden. A report of the lead, zinc, iron, copper, and minor minerals; stone, etc. 3800 w. *Wis Engr*—Jan., 1913. No. 40847 C.

RAILWAY ENGINEERING

CONDUCTING TRANSPORTATION...	450	PERMANENT WAY AND BUILDINGS	477
MOTIVE POWER AND EQUIPMENT.	454	TRAFFIC	489
NEW PROJECTS.....	474	MISCELLANY	493

Acceleration

CONDUCTING TRANSPORTATION

Collisions

Acceleration

Locomotive and Train Acceleration. Lawford H. Fry. Explains the direct method, illustrating its use by an example. 1800 w. Engr, Lond—May 2, 1913. Serial. 1st part. No. 42009 A.

Accidents

Why 5,000 Trespassers Are Killed Yearly. Gives data showing that inefficient government is responsible; better laws and their enforcement the remedy. 4800 w. Ry Age Gaz—Dec. 20, 1912. No. 38341.

The Mercy of Steel and the Menace of Wood. Illustrated study of some recent railroad accidents. 2200 w. Sci Am—Jan. 25, 1913. No. 39332.

Railroad Accidents, Their Causes and Remedy. D. F. Jurgenson. Abstract of a Report to the Nat. Assn. of Ry. Com. Discusses the importance of the human element in train operation, and the steps that should be taken. 2000 w. Ry Age Gaz—Jan. 3, 1913. No. 38791.

Railroad Accidents: Their Causes and Remedy. D. F. Jurgenson. Considers preventable and non-preventable accidents, their causes, suggested remedies, laws affecting railway operation, etc. 6500 w. Jour Assn of Engng Soc—March, 1913. No. 40432 C.

A Comparison of Railway Casualties in Great Britain and in the United States. Editorial. 1800 w. Eng News—Oct. 2, 1913. No. 45654.

The Aisgill Accident. Gives the statement made by Sir Guy Granet as to the action of the Midland Ry. Co. in meeting the suggestions of the Board of Trade inspectors. Also editorial. 3500 w. Engr, Lond—Sept. 19, 1913. No. 45573 A.

Report on North Haven Collision. Details from the report of the Interstate Commerce Commission on the rear collision of passenger trains occurring Sept. 2. 4000 w. Ry Age Gaz—Oct. 3, 1913. No. 45664.

See also Collisions, under *Conducting Transportation*.

Administration

Railroad Operating Administration. Edward L. Suffern. A suggestive study of the problem. 1300 w. Ry & Engng Rev—Feb. 8, 1913. No. 39754.

Africa

Transportation Facilities in Central Africa. Sydney H. Ball and Millard K. Shaler. A résumé of the progress in transportation facilities made in the Belgian Congo and neighboring colonies during 1912. Map. 3500 w. Min & Sci Pr—April 12, 1913. No. 41324.

Automatic Stops

The Automatic Stop. B. C. Rowell. Discusses arguments opposing its use, showing them to be based on false assumptions. 1800 w. Ry & Engng Rev—Feb. 8, 1913. No. 39755.

British Opinion on Railway Automatic Stops. H. Raynar Wilson. Illustrated review of the locomotive cab-signals in use in England and explanation of why their use has not been extended. 2500 w. Eng News—Jan. 30, 1913. No. 39590.

The Automatic Train Stop Problem. A. H. Rudd. Explains the difficulties encountered in adapting automatic stops to miscellaneous railroad service. 2500 w. Ry Age Gaz—June 6, 1913. No. 42676.

A Successful Automatic Train-Stop. Illustrated description of a device which stops the train and reports disregard of signals. 1500 w. Sci Am—Jan. 18, 1913. No. 39129.

Braking

Break-in-Two of Trains. Portion of a paper by F. B. Farmer discussing this problem, the cause, etc. 1800 w. Ry & Loc Engng—July, 1913. No. 43403 C.

Collisions

Six Passengers Killed at Stamford. Detailed account of the accident, with editorial comment. 3500 w. Ry Age Gaz—June 20, 1913. No. 42998.

Report on Stamford Collision. Reviews the report of the Interstate Commerce Commission on this rear collision of passenger trains which occurred June

Control

12, 1913. Also editorial. 4000 w. Ry Age Gaz—July 18, 1913. No. 43798.

The Latest and Worst New Haven Railway Disaster. Editorial criticism of the N. Y., N. H. & H. R. R. in relation to the rear collision of Sept. 2. Ills. 2500 w. Eng News—Sept. 11, 1913. No. 45075.

The North Haven Collision. Gives details of the causes of this wreck and statements as to preventive measures adopted. Also editorial. 9800 w. Ry Age Gaz—Sept. 12, 1913. No. 45079.

New Haven Officers' Salutatory. A document signed by the new president and vice-president. 1500 w. Ry Age Gaz—Sept. 26, 1913. No. 45446.

See also Accidents, under *Conducting Transportation*.

Control

Train Control. First of a series of articles describing the objects of train control and means of carrying it into practice. 3500 w. Engr, Lond—July 11, 1913. Serial, 1st part. No. 43904 A.

Deraiment

Cause of the Glen Loch Deraiment. Illustrated account of a remarkable failure of a latticed bridge column from an obscure cause, and possibly an obstruction on the track. 2500 w. Ry Age Gaz—Dec. 13, 1912. No. 38185.

Commissioner McChord on Westport Deraiment. From the report of the Interstate Commerce Commission. Demands long crossovers for all high-speed trains, and calls railways to account for neglecting automatic-stop. 3000 w. Ry Age Gaz—Dec. 13, 1912. No. 38188.

Locomotive Tender Deraiments. More contributions to the controversy which started last Sept., in a communication from E. W. Summers. A suggestion as to the Westport wreck. 3500 w. Ry Age Gaz—Jan. 31, 1913. No. 39599.

Engine Deraiments. Gives diagrams illustrating the deraiments of all classes of tender and tank engines, with explanatory notes. 800 w. Engr, Lond—April 4, 1913. No. 41246 A.

Deraiment of Trucks on Curves. Arnold Stucki. A study of the action of the different wheels of a car in entering upon, passing over and leaving the curve. 1500 w. Ry Age Gaz—Jan. 17, 1913. No. 39205.

See also Accidents, under *Conducting Transportation*.

Despatching

I. Diagrams Showing Train Movements at Stations. Mr. Kühl. II. Diagrams for Facilitating the Study of the Full Utilization of Tracks at Passenger Stations. A. Plate. III. Note on the Diagrams by Mr. Kühl and by Mr. Plate for Facilitat-

CONDUCTING TRANSPORTATION**Operation**

ing the Study of the Full Utilization of Platform Tracks at Passenger Stations. L. Weissenbruch and J. Verdayen. Related papers. 4000 w. Bul Int Ry Cong—Nov., 1912. No. 37707 G.

"Contingent Schedules" on the Virginian Railway. A scheme for simplifying the work of the train despatcher and diminishing the flagman's duty. 3500 w. Ry Age Gaz—Nov. 1, 1912. No. 37248.

Efficiency

See same heading, under **INDUSTRIAL ECONOMY**.

European Practice

Impressions of European Railway Practice. Henry W. Jacobs. Considers the superiority of European mechanical methods to be the result of training of employees and careful selection and design of material. 3000 w. Ry Age Gaz—March 21, 1913. No. 40746.

Facilities

The Country's Need of Greater Railroad Facilities. James J. Hill. Discusses the increase of business and the congested terminals on the railways of the United States. 5000 w. Ry Age Gaz—Dec. 20, 1912. No. 38344.

Flagging

The Flagging Rule and Its Enforcement. Explains some of the conditions and the complexity of problems. 3000 w. Ry Age Gaz—Oct. 17, 1913. No. 45916.

Freight Trains

Starting, Running and Stopping Long Freight Trains. F. B. Farmer. Extracts from a paper read at the convention of the Air Brake Assn. in St. Louis, May 7, 1913. 4500 w. Ry & Engng Rev—May 10, 1913. No. 41980.

Interlocking

The Interlocking of Railway Points and Signals. Reviews briefly the modern principles of railway signaling, especially the work of John Saxby. Ills. 2500 w. Engr, Lond—Aug. 15, 1913. No. 44729 A.

Note on the Installations of Saxby Interlocking Apparatus on the Belgian State Railways. René Minet. Deals with the rules which determine the arrangements, the methods of testing, and methods of maintenance. Ills. 30500 w. Bul Int Ry Cong—Aug., 1913. No. 44703 G.

Rules Governing the Construction, Maintenance and Operation of Interlocking Plants. Gives rules submitted and adopted by the Wisconsin Commission, to become effective Dec. 1, 1913. 2500 w. Engng & Con—Oct. 29, 1913. No. 46385.

Operation

Studies of Operation—The B., R. & P. William E. Hooper. A study of the policy

Consult Classification of the Index. See page 9.

Prussia

CONDUCTING TRANSPORTATION

Signaling

of an independent road. 4000 w. Ry Age Gaz—March 21, 1913. No. 40743.

Studies in Operation—The M. K. & T. Shows a substantial reduction was made in the transportation ratio of the Texas lines without the addition of heavier power. Map. 4500 w. Ry Age Gaz—May 30, 1913. No. 42634.

Studies of Operation—the C. B. & Q. A study of economical operation, showing that a growth in freight traffic from 1901 to 1912 of 98.3 per cent. was handled with a decrease of 9.8 per cent. in train miles. 3000 w. Ry Age Gaz—July 18, 1913. No. 43796.

Train Operation Sixty Years Ago. Comparison between the modern methods of train management and the ideas of 1852. 3000 w. Ry Age Gaz—Aug. 22, 1913. No. 44540.

Prussia

The Administration of the State Railways of Prussia-Hesse. William J. Cunningham. Describes the physical and traffic characteristics and comments on the service and operating features. 25000 w. Pro N Y R R Club—April 18, 1913. No. 42926.

Railphone

New English Wireless Railphone. Describes the railphone wireless inductive system of railway telephony, telegraphy and signalling as developed at Birmingham, England. Ills. 1500 w. Ry Engng & Main of Way—June, 1913. No. 42977.

Refrigeration

Organization for Handling Refrigeration Transportation. J. S. Leeds. Read before the Third Int. Cong. of Refrig. Explains requirements for handling perishable commodities. 3000 w. Ry & Engng Rev—Oct. 4, 1913. No. 45684.

Safety

Contributions to the Safety Contest. Methods of reducing accidents in the maintenance of way departments are described by various contestants. Ills. 5500 w. Ry Age Gaz—Nov 15, 1912. No. 37603.

The "Safety First" Movement. Mr. Bradshaw. Introductory remarks, with an account of what is being done on the New York Central R. R. Discussion. Ills. 14500 w. Pro W Ry Club. Feb. 18, 1913. No. 40862 C.

Safety on the Chicago & North Western. W. T. Gale. Prize article. An outline of organization for this work and illustrations of shop safeguards. Ills. 1200 w. Am Engr—March, 1913. No. 40343 C.

Safety on Railroads. J. W. Coon. Explains the work of safety committees, and discusses the problems to be solved

in safeguarding employees of railroads. Discussion. 18500 w. Pro N Y R R Club—Feb. 21, 1913. No. 40849.

See also Accidents, under *Conducting Transportation*.

Safety Work

Greater Efficiency in Safety Work. George Bradshaw. A discussion of matters relating to the safety first movement. 2000 w. Ry Age Gaz—April 18, 1913. No. 41347.

Schedules

Another Contingent Schedule Scheme. Explains a "safety" plan devised by G. W. Turner. Also a letter presenting arguments in its favor. 3000 w. Ry Age Gaz—Dec. 13, 1912. No. 38184.

Signaling

Signal System of the Panama R. R. Describes the new scheme of signalling adopted. 2200 w. Ry & Engng Rev—Nov. 30, 1912. No. 37957.

Mileage of Railroads Block Signaled. Gives report showing extensive new mileage of automatic block signals. 2000 w. Ry Age Gaz—Dec. 27, 1912. No. 38631.

Report of Block Signal and Train Control Board. Information from the final report. 3000 w. Ry Age Gaz—Feb. 19, 1913. No. 39853.

Automatic Block Signals on the Atlantic Coast Line R. R. B. W. Meisel. Illustrated description of the track and signal layout, the circuit plans, etc. 1200 w. Ry Engng & Main of Way—March, 1913. No. 40793.

Signaling Systems on the Métropolitain and Nord-Sud Railways of Paris (Les systèmes de signalisation du Métropolitain et du Chemin de fer Nord-Sud de Paris). J. Quinat. Detailed operating methods of both railways. Ills. 5600 w. Genie Civil—March 15, 1913. No. 40601 D.

Final Report of the Block Signal and Train Control Board to the Interstate Commerce Commission. Ills. 54 pp. Interstate Com. Com.—June 29, 1912. No. 41713 N.

Signal Engineering as a Field for Engineering Graduates. M. H. Hovey. An outline of the development of railway signaling. 2000 w. Wis Engr—Feb., 1913. No. 41264 C.

Automatic Stops and Audible Signals. A summary of recent information concerning automatic stops and their use on various roads. 2500 w. Ry Age Gaz—April 11, 1913. No. 41172.

Pennsylvania Terminal Signals and Interlocking. Illustrated description of the protective systems installed at the sta-

Signaling

CONDUCTING TRANSPORTATION

Train Control

tion in New York, and in the tunnels and in the approaches leading thereto. 6800 w. Ry Gaz, Lond—March 28, 1913. No. 41135.

Automatic Block Signal Records. Records of American practice and performance. Also editorial. 3300 w. Ry Age Gaz—June 13, 1913. No. 42819.

Railway Power Signalling. A brief description of the various systems in operation. 3000 w. Mech Wld—May 23, 1913. No. 43138 A.

Signal Department on Railroads. B. H. Mann. Considers some of the difficulties that have been met, and the value of signals. General discussion. 11500 w. Pro Cent Ry Club—May 9, 1913. No. 42799 C.

Electric Interlocking at Aliquippa, Pa. B. W. Meisel. Illustrated description of an all-electric installation on the Pittsburgh & Lake Erie R. R. 2500 w. Ry Engng & Main of Way—July, 1913. No. 43771.

Railway Signaling. A. H. Rudd. An account of the signals on the Pennsylvania R. R., the method of giving information to enginemen and means of securing accuracy, with a summary of the automatic stop situation. Discussion. 8500 w. Pro Ry Club of Pittsburgh—May 23, 1913. No. 44325 C.

An Unusual Signal Installation. Brief description of the switches and temporary automatic block signals installed for the celebration at Gettysburg. 500 w. Ry Age Gaz—Aug. 8, 1913. No. 44257.

The Possibilities of Flash Signalling in British Railway Practice. J. F. Gairns. Considers their limitations. 3000 w. Bul Int Ry Cong—Jan., 1913. No. 39554 G.

Flashlight Signals on the Swedish State Railways. Drawings and explanation of a system that has given satisfaction during a year's service. 1000 w. Engr., Lond—Jan. 10, 1913. No. 39274 A.

Block Signals and Interlocking Plants on the Chicago Great Western R. R. Illustrated detailed description. 1500 w. Eng News—Jan. 16, 1913. No. 39197.

Automatic Block Signals for Single Track; C. I. & L. Ry. From a paper by E. G. Strodling, read before the Indiana Engng Soc. Illustrated description of an extensive installation. 1500 w. Eng News—Jan. 9, 1913. No. 38947.

Washington Water Power Co.'s Block Signals. Frank C. Perkins. Describes an installation on high speed electric lines in the State of Washington. 1800 w. Ry Engng & Main of Way—Jan., 1913. No. 39279.

See also same heading, under **STREET AND ELECTRIC RAILWAYS.**

Speed

Calculating the Traveling Time and Speed of Railway Trains from the Load Limit of Locomotives (Die Berechnung der Fahrzeiten und Geschwindigkeiten von Eisenbahnzügen aus den Belastungsgrenzen der Lokomotiven). Herr Strahl. Formulae and the derivation of a chart for rapid determinations. Ills. Serial, 1st part. 3000 w. Glaser's Ann—Sept. 1, 1913. No. 46013 D.

Summer Services

The Summer Train Services. Reviews the changes made in train service for Great Britain. 2500 w. Engr, Lond—July 4, 1913. No. 43723 A.

Telephone Despatching

Use of Telephones on the Pennsylvania Railroad. J. C. Johnson. Abstract of a paper read before the Association of Ry. Telegraph Supt. Information concerning the extensive use of the telephone for despatching, discussing its objections and benefits. 1800 w. Ry Age Gaz—May 30, 1913. No. 42636.

Ticket Printing

Booking-Office Ticket-Printing Machines. H. Diehl. Describes recent developments in the printing of railway tickets, showing how much work and time are required from the printing of the tickets until they are in the hands of the passengers. 3900 w. Bul Int Ry Cong—July, 1913. No. 43983 G.

Ticket Selling

Conducting a Union Ticket Office. B. W. Frauenthal. Outline of the organization and methods used at St. Louis, Mo. 3300 w. Ry Age Gaz—Nov. 8, 1912. No. 37333.

The Rundreise Union. An account of its operations on the Continent and its system of issuing and selling tickets. 3000 w. Ry Gaz, Lond—Nov. 15, 1912. No. 37812 A.

Train Control

The Thury Multiple-Unit Train Control System as Applied to the Martigny and Chatelard Railway. Illustrated description of the apparatus and its working. 3000 w. Tram & Ry Wld—Aug. 14, 1913. No. 44796 B.

Automatic Wireless Train Control. Diagrams and description of the Prentice system. 1000 w. Engr, Lond—Aug. 29, 1913. No. 45046 A.

The Automatic Control of Trains. L. V. Lewis. Explains the problem of automatic train control and reviews the devices brought into use, discussing features of the automatic stop. 3500 w. Elec Jour—Oct., 1913. No. 46324.

The Detroit Automatic Train Control. Illustrates and describes the principal

Train Crews

features. 1500 w. Ry Gaz, Lond—Sept. 26, 1913. No. 45732 A.

Handling Modern Trains from the Air Brake Standpoint. Robert Burgess. Considers conditions the air brake must meet in handling freight and passenger trains. Discussion. 6500 w. Pro S & S-W Ry Club—July 17, 1913. No. 46101 C.

Train Control System of the L. and Y. Railway. Illustrated description of the graphic system used for controlling from central offices all the goods and mineral traffic. 800 w. Engr, Lond—Oct. 10, 1913. No. 45988 A.

Train Control on the North British Railway. Explains the control system and its object. Ills. 2000 w. Ry Gaz, Lond—Oct. 3, 1913. No. 45845 A.

Train Crews

The Arguments for and Against Train-Crew Legislation. Gives the history and present status of train operation, the provisions of the measures enacted and proposed, and a discussion of the effect of such legislation. 36 pp. Bureau of Ry Ec—Bul 53. No. 46118 N.

Train Service

German Express Trains. An account of recent changes and improvements introduced which make German non-stop runs rank next to Great Britain. 2200 w. Engr, Lond—Dec. 20, 1912. No. 38898 A.

Some Continental Train Improvements. An account of important new express

MOTIVE POWER AND EQUIPMENT

Air Brakes

services between England, France and Italy, to be put in force on the opening of the Lötschberg tunnel. 1200 w. Engr, Lond—June 13, 1913. No. 43149 A.

Train Stop

A Safety Automatic Train Stop. Illustrates and describes details of an automatic train stop system which has been under test for a year on the Pennsylvania railroad. 1500 w. Sci Am—May 3, 1913. No. 41781.

Transport

The Economic Considerations Which Determine the Cost of Transport. Trans. from C. Colson's "Transports et Tarifs." Considers the principles affecting transportation costs, the value of the service, and elements that determine value. 2500 w. Ry Gaz, Lond—March 28, 1913. No. 41134 A.

Transportation

Transportation and Business. W. W. Finley. Short papers introducing a general discussion. 8000 w. Pro St Louis Ry Club—Jan 10, 1913. No. 39941.

Some Aspects of the Subject of Transportation. J. E. Kuhn. Shows the rapid increase in population in the United States, the traffic demands, and discusses the railroads, motor vehicles, water transportation, ocean transportation, and related matters. 9500 w. Pro Engrs' Club of Phila—July, 1913. No. 44336 D.

MOTIVE POWER AND EQUIPMENT

Accumulator Traction

Storage Battery Cars on Steam Railways. Illustrated description of an electric storage battery car for use on the Tanana Ry. of Alaska, and a large car used by the Chicago Great Western. 1000 w. Ry Mas Mech—May, 1913. No. 42202 C.

Modern Accumulator Cars (Moderne Akkumulatoren-Fahrzeuge). H. Beckmann. Describes late types of batteries and their application to the driving of crane and mine locomotives, street cars, and boats. Ills. Serial. 1st part. 2200 w. Elek u Masch—April 20, 1913. No. 42161 D.

Aerial Tramways

See same heading, under MECHANICAL ENGINEERING, *Transporting and Conveying*.

Air Brakes

Excess Pressure Governor Top. Editorial discussion of brake pipe pressure and leakage, and the automatic regulation. 2000 w. Ry & Loc Engng—Nov., 1912. No. 37242 C.

The Electro-Pneumatic Brake System for Steam Road Service. Walter V. Turner and P. H. Donovan. Illustrated detailed description of an air-brake equipment for steam road cars and its operation. 7800 w. Jour Fr Inst—Nov., 1912. No. 37541 D.

Making the New York Air Brake. Fred H. Colvin. Illustrates and describes methods used in making the cylinders and piston rings in a water-power shop at Watertown, N. Y. 1500 w. Am Mach—Nov. 21, 1912. Serial. 1st part. No. 37664.

Operation of L. T. Brake. Recommendations for the New York L. T. brake equipment. 1500 w. Ry & Loc Engng—Nov., 1912. No. 37241 C.

Recent Developments in Passenger Brake Equipment. F. H. Parke. Reviews the development of the high-speed brake and the changes in rolling stock constantly requiring an increase in brake power. Refers to the electro-pneumatic development as probably the next improvement. Discussion. Ills. 6500 w.

Air Brakes

MOTIVE POWER AND EQUIPMENT

Brakes

Pro St Louis Ry Club—Nov. 8, 1912. No. 38281.

Main Reservoir Failures. Discusses these failures and possible causes. 600 w. Ry & Loc Engng—Dec., 1912. No. 38014 C.

Recent Developments in Air Brake Practice. S. W. Dudley. Reviews progress in this field during the past year. 1800 w. Elec Jour—Jan., 1913. No. 39439.

Electrically Operated Air Brakes. Discusses the development of electro-pneumatic brakes. 3000 w. Ry & Loc Engng—Feb., 1913. No. 39658 C.

The Electro Pneumatic Brake. N. A. Campbell. Discusses the system in which the application magnet valves make local brake pipe reductions. General discussion. 9000 w. Pro N Y R R Club—Jan. 17, 1913. No. 39942.

The Transmission of the Brake Action of the Atmospheric Brakes Used on Railways. A. Flegner. Examines how the transmission works, taking all resistances, as far as possible into consideration. 9000 w. Bul Int Ry Cong—Feb., 1913. No. 40166 G.

Frictional Resistance. Considers some of the effects of applying a brake shoe to a revolving car wheel. Gives tables from the Galton-Westinghouse tests, illustrating the experimental apparatus. 2500 w. Ry & Loc Engng—March, 1913. No. 40282 C.

Initiation and Propagation of Quick Action. Information from a paper by P. H. Donovan read before the Air Brake Assn. Gives results of an exhaustive series of tests. 1500 w. Ry & Loc Engng—April, 1913. No. 41031 C.

Car Brake Leverage. An explanation of the leverage problem. 1600 w. Ry & Loc Engng—April, 1913. No. 41030 C.

Savage Air Brake Attachments. Illustrations showing pipe connections, and a view of the operating parts, with description. 800 w. Ry & Loc Engng—May, 1913. No. 41842 C.

Modern Air Brake Equipment as Applied to Steam Roads. Charles U. Joy. Extracts from a paper read before the New England R R Club. Describes types and their action. 3300 w. Ry & Engng Rev—June 14, 1913. No. 42859.

Cross Compound Compressors. Drawings and description. 2200 w. Ry & Loc Engng—Sept., 1913. No. 44856 C.

Axleboxes

Locomotive Axleboxes. The present number discusses the design. Ills. 1500 w. Mech Wld—July 18, 1913. Serial, 1st part. No. 43959 A.

Boiler Inspection

Locomotive Boiler Inspector's Report. John F. Ensign. First annual report of the chief inspector of locomotive boilers to the Inter-State Commerce Commission. 3000 w. Boiler Maker—Jan., 1913. No. 38968.

Box Cars

Box Car Construction as Viewed by a Repairer. H. S. Fentress. A critical discussion of features of design and construction. 1500 w. Am Engr—May, 1913. No. 41837 C.

Brakes

Automatic Vacuum Brakes with Revolving Rings (*Frein à vide automatique à anneau roulant*). Describes action of piston encased with rubber rings in the Massard, Jourdain and Monneret system. Ills. 2200 w. All Indus—Oct., 1912. No. 37527 D.

Continuous Braking on Long Freight Trains (*Freinage continu des longs trains de Marchandises*). J. Netter. Experiments in Austria with quick acting automatic vacuum brakes. Ills. 3000 w. Tech Mod—Nov. 1, 1912. No. 37510 D.

Rapid Acting Vacuum Brake Trials in Austria. Gives results of the trials made on the Austrian State Railways last September, on behalf of the sub-commission of *l'Unité Technique*. 1500 w. Ry Gaz, Lond—Jan. 17, 1913. No. 39464 A.

Differential Compound Band-Couplings (*Differential-Verbund-Bandkupplung*). F. Springer. A study of the action of brakes of this type. Ills. 1700 w. Zeitschr des Ver deutscher Ing—Dec. 21, 1912. No. 39041 D.

Undesired Quick Action of Brakes. Abstract of a paper by C. N. Remfry. Gives instructions for triple valve cleaners. 2000 w. Ry Are Gaz (Mech Ed)—June, 1913. No. 42683 C.

The Effect of Changed Operating Conditions and Modern Rolling Stock on the Brake and What is Being Done to Make This Money-Saving or Money-Losing Apparatus as Efficient as Heretofore. Walter V. Gurner and P. H. Donovan. Ills. 68 pp. Pro Ry Club of Pittsburgh—April 25, 1913. No. 43755 C.

The Braking of Freight Trains by the Hardy Continuous Vacuum Brake (*Le Freinage des Trains de Marchandises par le Frein continu à vide Hardy*). Jacques Neblinger. Review of brake tests in recent years, and detailed description of the Hardy brake. Ills. 3600 w. Genie Civil—Aug. 2, 1913. No. 45345 D.

Braking Power Problems. Considers problems arising from the introduction of heavier cars and locomotives, high speed

Braking

and increase in traffic. 2000 w. Ry & Loc Engng—Oct., 1913. No. 45596 C.

Brake Equipment. L. G. N. Illustrated description of the development of the triple valve of the L. G. type. 1200 w. Ry & Loc Engng—Oct., 1913. No. 45595 C.

See also Automatic Stops, under *Conducting Transportation*.

Braking

Wheel Sliding Under Heavy Passenger Equipment. John P. Kelly. Discusses points of importance under modern conditions of heavy brake applications. General discussion. 10900 w. Pro Cent Ry Club—Nov. 8, 1912. No. 38622 C.

Car Building

Hard Wood for Railway Cars (Hart-hölzer für den Eisenbahnwagenbau). Dr. Weiskopf. An economic study of available materials, and experimental tests for compression and tension. Ills. Serial, 1st part. 3000 w. Glaser's Ann—Mar. 15, 1913. No. 41454 D.

Car Cleaning

Scientific Cleansing of Railway Coaches. J. T. Ainslie Walker. Discusses the sanitary condition of railway cars, the proper cleansing, etc. Ills. 1800 w. Ry Age Gaz—Feb. 21, 1913. No. 39981.

Car Construction

New Steel Car Plant at Michigan City. Illustrated description of interesting car building equipment. 1000 w. Ir Age—March 6, 1913. No. 40335 C.

Car Floors

Treatment and Finish of Passenger Car Concrete Floors. A committee report presented before the Master Car & Loc. Painters' Assn. Considers the treatment and finish of such floors. 3000 w. Ry Mas Mech—Dec., 1912. No. 38259 C.

Car Heating

History of Passenger Car Heating. Calvin S. Parker. Considers heating by the circulation of hot water, steam heating and the methods, direct steam heating, vapor or atmospheric pressure systems, and the Parker no-drip system. Also short paper by Jas. F. McElroy. Ills. 6000 w. Ry Mas Mech—Aug., 1913. No. 44468 C.

Car Inspection

Car Inspection. Lewis C. Ord. Read before the Can. Ry. Club. Explains the M. C. B. rules of car interchange and their object. 6000 w. Ry Mas Mech—Dec., 1912. No. 38260 C.

Car Lighting

Train Lighting. H. A. Currie and Benjamin F. Wood. Reviews the subject from the time candles were used, describing in outline the early methods, and discussing the later systems. 8000 w. Jour Am Soc

MOTIVE POWER AND EQUIPMENT**Car Repairs**

of Mech Engrs—Jan., 1912. No. 39351 D. Postal Car Lighting. Gives information from a recent bulletin describing the lighting system. 2000 w. Ry Age Gaz—Jan. 24, 1913. No. 39402.

Postal Car Illumination Tests. Gives results of extensive tests made by the Baltimore and Ohio and used as a basis of the new government specifications. 1500 w. Ry Age Gaz—March 21, 1913. No. 40744.

Postal Car Illumination Tests by the Baltimore & Ohio Railroad. Gives results of investigations. 1200 w. Ry & Loc Engng—April, 1913. No. 41033 C.

Mazda vs. Carbon Lamps for Car Lighting. Report of tests made by the Cleveland Ry. Co. to determine comparative efficiencies, with results. 2500 w. Elec Trac—March, 1913. No. 40718.

Electric Battery Lighting for D-Trains and Sleeping Cars on the Prussian Railways (Elektrische Sammlerbeleuchtung für D-Zug- und Schlafwagen der Preussischen Staatsbahn). Herr. Wilcke. Discusses the carrying arrangement on new cars. Ills. 4000 w. Elek Kraft u Bahnen—June 24, 1913. No. 43547 D.

Vickers Patent S. B. System of Train Lighting. Illustrated description of an improved system of train lighting using only a single battery. 1500 w. Elec Rev, Lond—Sept. 12, 1913. No. 45283 A.

Car Material

Specifications and Rules for Douglas Fir Car Material. Gives rules recently adopted by the West-Coast-Lumber Mfr. Assn. 1500 w. Ry Age Gaz—Sept. 26, 1913. No. 45443.

Car Painting

Baked Enamel Painting on the Cars of the Hudson & Manhattan Railroad. Illustrates and describes a method of car painting by which cars can be put through the shop in two days. 2500 w. Elec Ry Jour—Jan. 25, 1913. No. 39412.

Master Painters' Association. Report of convention, including important reports on finishing steel passenger train cars, paint protection for steel equipment, and paint tests. 5500 w. Ry Age Gaz—Sept. 19, 1913. No. 45259.

Theory and Practice of Painting a Modern Steel Passenger Car. J. W. Lawrie. Discusses the functions and essential properties of pigments and vehicles indicated in general. 4000 w. Sci Am Sup—Oct. 11, 1913. No. 45759.

Car Repairs

Growing Cost of Freight Car Repairs. F. F. Gaines. Discusses some of the causes; also suggestions for changes in design and methods to reduce it. 2000 w. Am Engr—April, 1913. No. 41093 C.

Car Roofs**Car Roofs**

The Car Roof Problem. Explains the difficulties encountered in the construction of car roofs, illustrating some states of dilapidation. 700 w. Ry & Engng Rev—May 31, 1913. Serial. 1st part. No. 42579.

Cars

Steel Coaches for the New York Central. Drawings and description. 900 w. Ry Age Gaz—Feb. 21, 1913. No. 39980.

New York Central Lines Steel Coaches. Illustrated detailed description of new equipment. Exceptionally complete insulation, and strong end construction are noticeable. 2500 w. Am Engr—Feb., 1913. No. 39722 C.

New Family Saloons, Central Argentine Railway. Illustrated description of fine coaches. 1500 w. Ry Gaz, Lond—Feb. 14, 1913. No. 40120 A.

Description of 54 Foot Corridor Composite Carriage of the Midland Railway of England. D. Bain. 1100 w. Bul Int Ry Cong—April, 1913. No. 41685 G.

Fifty-Ton Low Side Gondola. Illustrated description of a steel underframe, forty foot car, with drop ends, for the Central R. R. of New Jersey. 900 w. Am Engr—April, 1913. No. 41094 C.

Steel Passenger Car Design. A symposium of papers prepared by experts for presentation before the New York meeting of the A. S. M. E. Ills. 5500 w. Ry Age Gaz—April 11, 1913. Serial. 1st part. No. 41171.

Car Efficiency. Jos. R. Cavanagh. Explains the present practice of car handling and car hire and suggests a solution of the problem of car interchange by organizing a Clearing House. 2500 w. Pro St. Louis Ry Club—April 11, 1913. No. 42325.

Railway Cars Exhibited at the Turin International Trade and Industrial Exposition, 1911 (Die auf der internationalen Industrie- und Gewerbeausstellung Turin 1911 gezeigten Eisenbahnwagen). Herr Neubert. This first part describes the various Italian cars exhibited. Ills. Serial. 1st part. 1800 w. Gläfers Ann—April 15, 1913. No. 42125 D.

Passenger Coaches of the Dutch Indies Railway Company (De rijtuigen der Ned-Indische Spoorweg Maatschappij). B. M. Gratama. General dimensions and construction of these Holland-built cars. Ills. and plate. 2600 w. De Ingenieur—May 3, 1913. No. 42165 D.

Standard Box Car Construction. Reviews efforts made tending toward the development of a standard type. Ills. 3000 w. Ry Mas Mech—June, 1913. Serial. 1st part. No. 42853 C.

MOTIVE POWER AND EQUIPMENT**Control Valves**

Special 75-Ton Flat Car. R. S. Mounce. Illustrated description of a flat car for transporting turbine wheels 16 ft. 2 in. in diameter, built by the Erie R. R. 700 w. Ry Age Gaz (Mech Ed)—July, 1913. No. 43426 C.

Method of Designing a Steel Gondola Car. L. W. Wallace. 2nd prize paper. Shows the method of designing the parts of a steel gondola freight car that are usually given theoretical consideration. Ills. 4500 w. Ry Age Gaz (Mech Ed)—July, 1913. No. 43425 C.

Box Car for Grain and Coal Traffic. Illustrated description of Burnett hopper bottom grain cars built by Canadian Pacific. 600 w. Ry Age Gaz—July 11, 1913. No. 43664.

Improved Methods of Freight Car Construction. R. W. Schulze. Discusses efficient design. Ills. 1800 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44267 C.

Steel Frame Box Cars for the Frisco. Illustrated detailed description of cars designed to be water-proof, burglar-proof, grain-leakage-proof, and to protect the lading from damage. 1200 w. Ry Age Gaz—Oct. 3, 1913. No. 45661.

The Steel Passenger Car and Existing Passenger Equipment. First of a series of articles reviewing the situation as it exists. 1300 w. Ry & Engng Rev—Oct. 25, 1913. Serial. 1st part. No. 46221.

See also Steel Cars, under *Motive Power and Equipment*.

Car Trucks

Freight Car Truck Experiments. Abstracted from Prof. Endsley's report to the American Steel Foundries. Gives results of a series of tests on square and loose freight car trucks. 2000 w. Am Engr—Jan., 1913. No. 38967 C.

Car Ventilation

Ventilation of Steel Sleeping Cars. Thomas R. Crowder. Abstract of a paper read before the Cong. on Hygiene and Demography. Reports results obtained with exhaust ventilators and no deck sashes. 3500 w. Ry Age Gaz—Feb. 14, 1913. No. 39852.

Connecting Rods

Locomotive Connecting Rods. H. A. F. Campbell. Discusses the formulæ and constants used by the Baldwin Locomotive Works. 2500 w. Am Engr—April, 1913. No. 41088 C.

Control Valves

Control Valve Test Rack. Illustrated description of the Westinghouse control valve test rack, which is to determine the fitness for service of the No. 3E and 3D control valves. 1200 w. Ry & Loc Engng—July, 1913. No. 43402 C.

Couplers

Couplers

The Problem of the Automatic Coupling of Wagons on European Railways. A Campiglio. Reviews the development of Automatic coupling, describing systems. Ills. 3600 w. Bul Int Ry Cong—June, 1913. No. 43171 G.

Car Coupling with the Boirault Automatic Coupler (L'attelage automatique des wagons par l'auto-coupeur Boirault). G. Espitalier. Detailed description of the construction and action. Ills. 4500 w. Genie Civil—June 14, 1913. No. 43089 D.

Coupling

The Problem of the Automatic Coupling of Wagons on European Railways. A. Campiglio, and a letter by L. Boirault. 2600 w. Bul Int Ry Cong—Oct., 1912. No. 46222 G.

Coupling Rods

Note on the Working of Coupling Rods. G. L'Hoest. Gives an analysis of the working. 3400 w. Bul Int Ry Cong—Dec., 1912. No. 38675 G.

Deck Shields

Locomotive Deck Shields. Walter R. Hedeman. Describes shields designed to prevent the loss of coal through the large openings in the firing decks of locomotives, and through the openings between the engine and tender. Ills. 1000 w. Am Engr—March, 1913. No. 40340 C.

Draft Gear

Testing of Draft Gear Prior to Purchasing. Bruce V. Crandall. Considers the necessity of testing of draft gear, to prove fitness, for comparison, and to meet certain specifications; the requirements, etc., general discussion. 1200 w. Pro W Ry Club—April 15, 1913. No. 42400 C.

Driving Box

Flangeless Shoes and Wedges and Improved Driving Box Construction. C. D. Ashmore. Illustrated description. 800 w. Am Engr—Nov., 1912. No. 37309 C.

Dynamometer Cars

The Dynamometer Car. Information concerning the use of this device for measuring the force exerted in overcoming resistance, and recording the distance and time. 2500 w. Ry & Loc Engng—Dec., 1912. No. 38015 C.

Electric Locomotives

Articulated Truck Electric Locomotives. N. Y., N. H., & H. R. R. Illustrated description of engines under construction which combine the best features for heavy locomotives as shown by road service. 2000 w. Ry Mas Mech—Nov., 1912. No. 37343 C.

Problems of Electric Locomotive Design. N. W. Storer. A discussion and brief description of the types now in

MOTIVE POWER AND EQUIPMENT

Electrification

service. 2500 w. Am Engr—Nov., 1912. No. 37305 C.

Southern Pacific Electric Locomotives. Illustrated description of one of the new 60-ton electric freight locomotives 1200 w. Mach (Ry Ed)—Nov., 1912. No. 37349 C.

Southern Pacific Electric Locomotives. Illustrated description of a 50-ton electric locomotive for freight and switching service. 1200 w. Ry Age Gaz—Nov. 22, 1912. No. 37762.

A New 1500 H. P. Electric Locomotive for the Compagnie des chemins de fer du Midi (Nouvelle locomotive électrique de 1500 chevaux de la Compagnie des chemins de fer du Midi). Principal characteristics and details of construction. Ills. 8400 w. Tech Mod—Jan. 1, 1913. No. 39074 D.

Electric Traction

Working Practice with Electric Traction at Simplon (Betriebserfahrungen bei der elektrischen Zugförderung am Simplon). Bruno Kilchenmann. The power plants, wiring and locomotives in use to and through the tunnel. Ills. 4200 w. Elek Kraft u Bahnen—July 24, 1913. No. 44683 D.

Prof. Kapp's Address to Section "G" of the British Association. Abstract of an address at Birmingham, Eng., on the advantages of the various systems of electric traction. 4500 w. Elect'n, Lond—Sept. 12, 1913. Serial, 1st part. No. 45290 A.

Electrification

Electrification of the Railway Lines of Brussels, Circle and Suburban. (L'Electrification des Lignes de Chemins de fer de la Ceinture et de la Banlieue de Bruxelles). J. Carlier. Describes project for connecting the railway stations in Brussels by short direct routes in connection with existing local and suburban lines. Electric system and motive power discussed. Ills. 45 pp. Rev Soc Belge d'Electriciens—Aug., 1912. No. 37482 E.

Discussion on "The Relation of Central Station Generation to Railway Electrification." Samuel Insull. At New York, April 5, 1912, and Boston, Mass, June 26 and 27, 1912. 22000 w. Pro Am Inst of Elec Engrs—Dec., 1912. No. 38513 F.

Electrification of the Melbourne Railways. Abstract of the recent report on the direct-current and single-phase systems. Also editorial. Ills. 5800 w. Ry Gaz, Lond—Nov. 22, 1912. No. 38023 A.

The Electrification of Main Lines. G. Brecht. Trans. of an article in *Elek. Kraft. und Bahnen*. Gives reasons for the slow advance and detailed discussion

Electrification

of the systems for main line service. 3000 w. Elect'n, Lond—Nov. 29, 1912. Serial. 1st part. No. 38112 A.

The Electrification of Main Lines (Einiges über Elektrisierung von Hauptbahnen). G. Brecht. Outlines points to be considered in undertaking extensive electrification; choice of systems, locomotives, etc. Ills. 6600 w. Elek Kraft u Bahnen—Nov. 14, 1912. No. 38470 D.

Extracts from Bulletin No. 4 of the Swiss Electric Railway Research Commission (Auszug aus der Mitteilung Nr. 4 der Schweizerischen Studienkommission für elektrischen Bahnbetrieb). W. Wyslasing. Discusses the questions of system and costs for hydro-electric power on Swiss railways. Ills. 4800 w. Schweiz-Bau—Nov. 2, 1912. No. 38493 D.

Electrification of the Rjukan Railway (Elektrisierung der Rjukanbahn). Dr. Marguerre. An account of the work completed on this Norwegian road; description of the line, and cars and locomotives used. Ills. 12000 w. Elek Kraft u Bahnen—Dec. 4, 1912. No. 38474 D.

Steam Road Electrifications. A. H. Armstrong. Discusses mountain grade service and shows the economy of electric locomotives. 4500 w. Elec Ry Jour—Jan. 4, 1913. No. 38824.

Railway Trunk Line Electrification. N. W. Storer. Abstract of a paper read before the Assn. of Ry. Elec. Engrs. Considers important problems, and gives a resumé and brief description of types of electric locomotives. Ills. 3000 w. Ry Age Gaz—Nov. 1, 1912. No. 37247.

Trunk Line Electrification. N. W. Storer. Briefly considers six types of high speed locomotives and other considerations in the choice of a system. 4000 w. Can Elec News—Jan. 15, 1913. No. 39181.

The Electrification of Steam Railways. N. W. Storer. Discusses questions regarding the applications, the advantages, costs, the successful installations at terminals, tunnels, etc. Ills. Discussion. 6000 w. Jour Cleveland Engng Soc—March, 1913. No. 40866 C.

Electrification of Heavy Grades. C. L. de Mural. Investigates how electrification compares with grade reduction or the introduction of more powerful steam locomotives. 1800 w. Ry Age Gaz—Jan. 17, 1913. No. 39203.

Electrification of the London and North-Western Suburban Lines. Information regarding this proposed electrification. 2500 w. Engr, Lond—Dec. 20, 1912. No. 38895 A.

Experimental Traction with Monophase

MOTIVE POWER AND EQUIPMENT

Electrification

Current at 12,000 Volts by the Compagnie des chemins de fer du Midi (Essais de traction à courant monophasé, à 12,000 volts, de la Compagnie des Chemins de fer du Midi). A. Bidault des Chaumes. Initial tests tending toward the electrification of a portion of the Midi system. Ills. and plate. Serial. 1st part. 7000 w. Génie Civil—Dec. 28, 1912. No. 39087 D.

Electrification on the Midi Railway. Illustrated description of the work of electrifying certain sections of this French line. 2500 w. Eng, Lond—Jan. 31, 1913. Serial, 1st part. No. 39815 A.

Report of Committee on Electricity. A report of progress and information. Ills. 6000 w. Bul Am Ry Engng Assn—March, 1913. No. 40623 N.

The Washington & Old Dominion Railway. N. W. Smith. Illustrates and describes a typical suburban steam road in Northern Virginia, with a single track length of about 60 miles, which has been electrified and its entrance into Washington changed. 6000 w. Elec Ry Jour—March 22, 1913. No. 40777.

The Power Requirements on Future Electrification of Swiss Railways (Ueber die Kraftwerksausnutzung beim zukünftigen elektrischen Betrieb der Schweizerischen Eisenbahnen). W. Kummer. A study of the possible demands for electric power. Diagrams. 3000 w. Schweiz Bau—Feb. 15, 1913. No. 40530 D.

Progress in Electrification. Addresses by different experts in this field at the ninth annual electrical night. 15000 w. Pro N Y R R Club—March 21, 1913. No. 41571.

Principles of Electric Railroading. C. L. de Mural. Reviews some of the fundamental laws that underlie all propulsion of trains on tracks, showing how they affect the technical as well as the financial side of electrification. 1200 w. Ry Age Gaz—April 4, 1913. Serial. 1st part. No. 41074.

The Development of the Electric Railway (Die Entwicklung der elektrischen Bahnen). P. Poschenrieder. Progress made since the first experiments made by Faraday in 1821. Ills. 4800 w. Elek u Masch (Special)—March, 1913. No. 41493 D.

Electrification Project for the Small Suburban Lines Leading to the State Terminals at Paris (Projet d'électrification des lignes de petite banlieue aboutissant aux gares de l'Etat, à Paris). M. Guignard. Plans for increasing the electrification systems entering Paris. Ills. and map. 5600 w. Génie Civil—Mar. 22, 1913. No. 41525 D.

Consult Classification of the Index. See page 9.

Electrification

MOTIVE POWER AND EQUIPMENT

Electrification

Electrification of British Railways. A survey of past and present electrification work by British steam railroads. 3500 w. Elec Ry Jour—May 3, 1913. No. 41873.

Trunk Line Electrification. Charles P. Kahler. Outlines steam railroad conditions in the West and gives some of the results which would occur with electric operation. 9500 w. Pro Am Inst of Elec Engrs—May, 1913. No. 42453 F.

Single-Phase Motor Car Equipments for Trunk Line Service. E. F. W. Alexander. Explains the principles of the single-phase commutator motor, and the theory, design, mechanical construction, electrical characteristics and operation. 3000 w. Gen Elec Rev—May, 1913. No. 41816 C.

The Use of Single-Phase Commutator Motors for Electric Traction on Long-Distance Railways. Stanley Parker Smith. A discussion of the technical problems involved in the electrification of main lines. 40 pp. Inst of Civ Engrs—No. 4002. No. 42368 N.

2400-Volt Railway Electrification. H. M. Hobart. Discusses the altered conditions which often make electrical operation economically superior to steam operation. 3500 w. Pro Am Inst of Elec Engrs—May, 1913. No. 42452 F.

Notes on the Midi D. C. and A. C. Electrifications. Describes an 850-D. C. third-rail local system and an experimental section operated at 16 2/3 cycles, 12,000 volts, single phase. Ills. 2500 w. Elec Ry Jour—May 3, 1913. No. 41872.

The Electrification Schemes of the Chemin de Fer du Midi. M. Jullian. (Abstract.) A summary of the reasons for electrifying certain sections and adopting single-phase traction with description of the plant, equipment, etc. 6000 w. Elect'n, Lond.—May 30, 1913. No. 42765 A.

High-Voltage Continuous Current Traction (Sur la traction à courant continu à haute tension). M. Gratzmuller. A committee report on the availability of continuous current for heavy duty, and results on the lines now using it. Ills. 11200 w. Bull Soc Int d'Electriciens—Apr., 1913. No. 42186 F.

Electrification Progress in the United States. Reviews the progress in steam railroad electrification from the earlier tunnel and terminal work to the long distance and mountain railway projects. Maps. 2500 w. Elec Ry Jour—May 31, 1913. No. 42720.

Railway Electrification Problems in the United States. H. Parodi. (Abstract.) Considers the various aspects of the prob-

lem when the substitution of electricity for steam appears to be justified by considerations of safety and economy. 4500 w. Elect'n, Lond.—May 30, 1913. No. 42766 A.

Maintenance on the Electrified Section of the Erie Railroad. Outlines the present condition of an installation with single-phase current made six years ago near Rochester, N. Y. Ills. 1500 w. Elec Ry Jour—June 7, 1913. No. 42718.

The Electrification of the State Railways: The Paris Suburban Lines. A. N. Mazen. (Abstract.) An account of the traffic, working, choice of system, station etc. 2500 w. Elect'n, Lond.—May 30, 1913. No. 42767 A.

Comparison between Traction Systems in Connection with Main-Line Electrification (Comparison entre les systèmes de traction en concurrence pour l'électrification des grandes lignes). E. de Marchena. The relative advantages of monophasic and triphase systems. 3000 w. Genie Civil—May 17, 1913. No. 43081 D.

Railway Electrification Problems in the United States. L. Esbran. Abridged translation of a contribution to the discussion of H. Parodi's paper presented to the Inst. of Elec. Engrs. at Paris. 2000 w. Engng—June 27, 1913. No. 43643 A.

Individual Paper on Maintenance of Electric Equipment. C. H. Quereau. A discussion from the viewpoint of a steam motive-power man. 3000 w. Ry & Loc Engng—July, 1913. No. 43404 C.

The Utilization of Power in the Future Electric Operation of the Swiss Railways. Dr. W. Kummer. Discusses the amount of power required, the conditions under which the power stations could be best utilized, and related topics. 3200 w. Bul Int Ry Cong—July, 1913. No. 43982 G.

Electrification of the Butte, Anaconda & Pacific. Describes one of the largest installations of electrical equipment for steam railroad service and the first in the United States to use d. c. locomotives on as high a potential as 2400-volts. Ills. 2500 w. Ry Mas Mech—Aug., 1913. No. 44470 C.

Steam Railroad Electrification. Charles P. Kohler. Outlines the apparatus and equipment needed to operate a railroad by electric power, showing the comparative cost of steam and electricity, and some resulting improvements. 4000 w. Jour Assn of Engng Socs—Sept., 1913. No. 45461 C.

Mountain Railway Electrification. A study of the Tehachapi Pass. Allen H. Babcock. A study of the relative merits of steam and electric equipment. 6000 w.

Electrification

MOTIVE POWER AND EQUIPMENT

Fuel

Pro Am Inst of Elec Engrs—Sept., 1913. No. 45518 F.

Why Steam Railroads Are Electrifying. W. R. Stinemetz. Brief notes on the application of the electric system at terminals, in tunnels, and on grades; locomotive development and use on main lines. Ills. 2000 w. Elec Jour—Oct., 1913. No. 46321.

Heavy Electrification Tendencies. W. S. Murray. Discusses the general aspects and reviews the tendencies of the present time. 2000 w. Elec Jour—Oct., 1913. No. 46318.

Electrification of Trunk Lines in Europe. R. E. Hellmund. A résumé of information gathered during a recent inspection trip of the more important European trunk line electrifications. 5000 w. Elec Jour—Oct., 1913. No. 46326.

The Norfolk & Western Electrification. F. F. Rohrer. An account of the plan to operate a main line over mountain grades in Virginia and West Virginia, handling heavy coal trains on up grades. 1200 w. Elec Jour—Oct., 1913. No. 46320.

Some Views on the Discrimination of Main-Line Electrification (Einige Gesichtspunkte zur Beurteilung der elektrischen Vollbahntraktion). Hans Zallud. A study of the choice of systems best suited for particular services. 1500 w. Elek u Masch—Aug. 31, 1913. No. 46077 D.

See also **Accumulator Traction**, under *Motive Power and Equipment*, Switzerland, under *New Projects*, and Australia, under *Street and Electric Railways*.

Equipment Cost

Assignment of Steam and Electric Locomotives, Passenger and Freight Train Cars, and Work Equipment Cost to the Several States, and to Operating Divisions Within States. A. I. T. Thompson. Discussion in a paper to the Mississippi Valley States conference. 4000 w. Engng & Con—June 25, 1913. No. 43195.

Feed-Water

Locomotive Feed-Water Heating. Illustrated description of the Weir locomotive feed pump and heater combination. 700 w. Engr, Lond—Dec. 20, 1912. No. 38899 A.

Feed-Water Preheating for Locomotives (Speisewasservorwärmung bei Lokomotiven). Ludwig Schneider. Part one discusses the subject in general, and the economy and theory of preheating. Diagrams. Serial, 1st part. 4900 w. Zeit des Ver deutscher Ing—May 3, 1913. No. 42146 D.

Feed-Water Heating for Locomotives. Ludwig Schneider. Abstract trans. from *Zeit. des Ver. Deut. Ing.* Considers its beneficial effects on the boiler and the re-

quirements of a good heater. Ills. 1500 w. Power—Sept. 16, 1913. No. 45128.

Fireboxes

The Design of Locomotive Fireboxes. J. D. Twinberrow. A study showing that broken stays and cracks are usually due to characteristics of the design. Ills. 2500 w. Engng—Nov. 15, 1912. No. 37822 A.

Tests Relating to the Pulling Out of Stays and the Deformation of the Flat Walls of Fire-Boxes. M. V. Gololobor. Report of tests made to determine the limiting dimensions permissible for the thickness of firebox walls and for the heads of the stays connecting them. 4000 w. Bul Int Ry Cong—Jan., 1913. No. 39555 G.

The Value of Fire-Box Heating Surface. Editorial on recent systems and theories advanced and tests made. 1500 w. Engng—Feb. 14, 1913. No. 40132 A.

Results of Comparative Fire-box Tests. A summary of tests recently conducted at Coatesville, Pa., with brief references to methods employed. 1800 w. Ry Age Gaz—Feb. 7, 1913. No. 39715.

Firebox Roof Girder Formula. F. A. Garrett. Gives chart and description of the principles involved, working out an example. 700 w. Boiler Maker—June, 1913. No. 42971.

Freight Cars

Steel Freight-Car Equipment. Pennsylvania R. R. Illustrated detailed description of the underframing and other features adopted for these cars. 2200 w. Ry & Engng Rev—Nov. 2, 1912. No. 37269.

A Strong Box Car End. Illustrated description of the steel end being applied to the box cars of the N. Y. C. & H. R. R. R. 500 w. Am Engr—Jan., 1913. No. 38966 C.

Ninety-Ton High Side Gondola Car. Illustrated description of cars developed on the Norfolk & Western and equipped with specially designed six-wheel equalized trucks. 2000 w. Ry Age Gaz—Jan. 3, 1913. No. 38792.

Freight Car Troubles. J. C. Fritts. Discusses freight car troubles, their cause and effect, and suggests changes in present practice tending to economical maintenance. Ills. Discussion. 11000 w. Pro Cent Ry Club—Sept. 12, 1913. No. 46102 C.

Fuel

International Railway Fuel Association. An account of the meeting including among other reports those on self-propelled cars and semi-bituminous and lignitic coals. 8000 w. Ry Age Gaz—May 30, 1913. No. 42637.

Fuel Economy

Railway Fuel Association Convention. Abstracts of addresses and discussions. 8000 w. Ry Age Gaz (Mech Ed.)—June, 1913. No. 42680 C.

Sub-Bituminous and Lignitic Coal as Locomotive Fuel. Samuel B. Flagg. Extracts from a paper read before the Int Ry Fuel Assn. Considers the arrangements for using these fuels, the tendency to disintegrate upon exposure, giving data and results. 2500 w. Ry & Engng Rev—June 7, 1913. No. 42709.

Powdered Fuel for Locomotives. Walter D. Wood. Calls attention to past mistakes in trying to use powdered fuel on locomotives, and how to use it successfully. 2500 w. Ry Age Gaz—July 4, 1913. No. 43477.

Fuel Economy

Fuel Economy on a Trunk Line Railroad. Dr. W. B. Landon. Discusses possible savings, inspection and some things it has accomplished. 4500 w. Ry & Engng Rev—Jan. 18, 1913. No. 39235.

Fuel Economy on the Rock Island. W. J. Tollerton. Explains the system adopted. 1500 w. Ry Age Gaz—Jan. 17, 1913. No. 39202.

Fuel Economy on the Buffalo, Rochester & Pittsburgh. H. C. Woodbridge. Drawings and description of a draft regulating damper and its operation. 1200 w. Ry Age Gaz—Feb. 14, 1913. No. 39854.

The Coal Pile. J. S. Sheafe. Suggestion for the care in the transportation, delivery, and burning of coal on railways. 2500 w. Ry Mas Mech—June, 1913. No. 42855 C.

Locomotive Fuel Economy. R. Collett. Outlines results obtained on the Frisco Lines and the practices which have given a fair measure of success. Gives a chart of the comparative consumption of coal on these lines during 1910, 1911, and 1912. Discussion. 13500 w. Pro St Louis Ry Club—May 16, 1913. No. 42904.

Are You Watching the Coal Pile? D. C. Buell. Gives a series of questions and suggestions emphasizing the necessity of giving detail attention to the fuel problem. 3500 w. Ry Age Gaz—Aug. 8, 1913. No. 44256.

Fuel Economy by the Engine Crew. M. E. Wells. Gives some interesting comparisons made, and discusses firing and overloading tanks at coal tipples. 800 w. Ry Age Gaz—Sept. 26, 1913. No. 45445.

Funiculars

See Aerial Tramways, under MECHANICAL ENGINEERING, *Transporting and Conveying*.

Headlights

Headlight Tests. C. M. Larson. Detailed report of tests, with tables and dis-

MOTIVE POWER AND EQUIPMENT**Locomotive Boilers**

cussion. 108 pp. Pro W Ry Club—Oct. 15, 1912. No. 37682 C.

Wisconsin Commission on Locomotive Headlights. Abstract of a decision by the Railroad Commission of Wisconsin as to which of the lights tested comply with the Laws of 1911. 1200 w. Ry Age Gaz—Dec. 13, 1912. No. 38189.

The Electric Arc Headlight for Locomotives. John G. D. Mack. General remarks on the development of headlights, the types used, etc., stating the requirements and discussing particularly the electric arc headlight. 3500 w. Wis Engr—Dec., 1912. No. 39311 C.

Fundamental Principles of Head-Lamp Illumination. L. C. Porter and K. W. Mackall. Discusses the standardization of locomotive headlamps and the requirements. 1200 w. Elec Wld—July 19, 1913. No. 43841.

Installation and Maintenance of Electric Headlight Equipment. V. T. Kropidowski. The present article describes a method of wiring which can be applied with an existing type of electric headlight equipment. 1200 w. Ry Age Gaz (Mech Ed)—July, 1913. Serial, 1st part. No. 43424 C.

Indicators

Locomotive Indicating Apparatus. Hal R. Stafford. Illustrates and describes methods used, giving general instructions for piping up indicators, and other information. 3500 w. Ry & Engng Rev—Jan. 11, 1913. No. 39113.

Inspection Cars

Motor Inspection Cars (Motordraisinen). L. Merz. Illustrated review of several types of single-, double-, and multiple-seated inspection cars. 3600 w. Motorwagen—Dec. 20, 1912. No. 39022 D.

Track Inspection Car; Erie R. R. Illustrated description of a car designed particularly to ascertain track conditions in regard to the safety of high-speed trains. 1500 w. Eng News—Oct. 2, 1913. No. 45652.

Locomotive Boilers

The Locomotive Boiler and Means for Increasing Its Efficiency and Capacity. A. W. Whiteford. Discusses design, the value of fire-box heating surface, capacity, etc. General discussion. Ills. 1300 w. Pro S & S-W Ry Club. Nov., 1912. No. 39937 N.

Inspection and Maintenance of Locomotive Boilers. John F. Ensign. Outlines some of the more important laws as to the use of safety appliances on railroads, and considers the requirements of the law in regard to inspection and repair of locomotive boilers. 5000 w. Pro St Louis Ry Club—Feb. 14, 1913. No. 40397.

Consult Classification of the Index. See page 9.

Locomotive Building

MOTIVE POWER AND EQUIPMENT

Locomotive Loads

Service Inspection and Repairs of Locomotive Boilers and Appurtenances. C. E. Lester. Gives the writer's views on boiler inspection. 2500 w. Boiler Maker June, 1913. No. 42970.

Maintenance of Locomotive Boilers. Report to the Am. Ry. Mas. Mech. Assn. Ills. 7500 w. Ry Mas Mech—July, 1913. No. 43772 C.

Locomotive Boiler Inspection. From an address by Garland P. Robinson before the Richmond R. R. Club. Illustrations of explosions, explaining causes, and information concerning inspection laws and the work of inspectors. 4000 w. Ry & Engng Rev—July 5, 1913. No. 43446.

Remarks Concerning the Efficiency and Capacity of Locomotive Boilers. W. L. Bean. Remarks on design and construction, with suggestions on firebox heating surface, volumes and grate areas, and means of improving combustion. Ills. Discussion. 5000 w. Pro St. Louis Ry Club—July 11, 1913. No. 44376.

Locomotive Building

Materials Used in Locomotive Construction. S. Snell. Discusses the different materials used, and the purposes for which they are used. 1300 w. Mech Wld—April 25, 1913. Serial, 1st part. No. 41925 A.

Locomotive Combustion

Combustion in Locomotive Practice. J. T. Anthony. Discusses the problem of increasing boiler efficiency and the importance of the firebox. Ills. 6000 w. Ry Age Gaz—June 6, 1913. No. 42678.

Locomotive Cylinders

Steam Action in Locomotive Cylinders. Lawford H. Fry. Compares results obtained with saturated and superheated steam in the same pair of locomotive cylinders, showing how the economy due to superheating is affected by changes in the speed, cut-off and boiler pressure. 3000 w. Engng—Jan. 3, 1913. Serial. 1st part. No. 39154 A.

The Repair of Locomotive Cylinders (Note sur la Réparation des Cylindres de Locomotives). M. Bonnin. An outline of steps to be followed in rivetting and welding. Ills. 2200 w. Rev Gen des Chemins de Fer—July, 1913. No. 43572 G.

Locomotive Design

Notes on the Action of Connecting Rods (Note sur le Fonctionnement des Bielles d'accouplement). G. L'Hoest. Mathematical discussion. Extracted from *Bulletin of the International Railway Congress*. Ills. 6000 w. Rev Soc Belge d' Elec—Sept., 1912. No. 37483 E.

The Design of Tank Engines for Ex-

press Working. J. D. Twinbrow, in *The Locomotive*. Discusses the conditions in this first article of a series. 1700 w. Mech Wld—March 21, 1913. Serial. 1st part. No. 41012 A.

A Consideration of British Express Locomotive Design. E. A. Johnson. Considers the principles of locomotive design as affected by modern express traffic conditions in Great Britain. 2000 w. Engr, Lond—Aug. 29, 1913. Serial, 1st part. No. 45040 A.

Reduced Live Loads on Railway Under-Bridges. J. D. W. Ball. Explains method of calculating bending moments and the distribution of loads on engines. 2500 w. Engr, Lond—Oct. 10, 1913. No. 45986 A.

Locomotive Efficiency

Locomotive Fuel Consumption and the Speed Diagram. A. K. Shurtleff. An economic study, of fuels and speeds. 4500 w. Bul Am Ry Engng Assn—Aug., 1912. No. 37677 E.

Locomotive Fireboxes

Life of Locomotive Fireboxes. C. T. Rommel. Considers the outwardly inclined water leg the most desirable, direction of rolling sheets important, materials, and that the single piece firebox is a mistake. Ills. 2500 w. Ry Age Gaz—July 18, 1913. No. 43797.

Gaines Firebox on the Illinois Central. Information concerning the satisfactory service, describing the design. 1200 w. Ry Age Gaz (Mech Ed)—July, 1913. No. 43423 C.

Locomotive Frames

Vanadium Cast Steel Locomotive Frames. Report of behavior in service. Ills. 2000 w. Ry & Engng Rev—June 7, 1913. No. 42710.

See Castings, under MECHANICAL ENGINEERING, *Machine Works and Foundries*.

Locomotive Fuel

Sub-Bituminous and Lignitic Coal as Locomotive Fuel. Samuel B. Flagg. A report to the Int. Ry. Fuel Assn. Discusses the present and future use of low-grade coals. Ills. 4000 w. Ry Mas Mech—Oct., 1913. No. 45899 C.

Locomotive Haulage

The Hauling Capacity of Locomotives. Part of a paper by H. D. Cameron, read before the W. Can. Ry. Club. Considers speed resistance, resistance due to curvature, grade resistance, and tractive effort. 2500 w. Can Engr—May 1, 1913. No. 41876.

Locomotive Loads

Experiments on the Determination of Limiting Loads for Locomotives (Verfahren zur Bestimmung der Belastungsgrenzen der Dampflokomotiven). Herr

Consult Classification of the Index. See page 9.

Locomotive Lubricants MOTIVE POWER AND EQUIPMENT**Locomotives**

Strahl. A mathematical discussion, with curves and tables. Serial 1st part. 5500 w. Zeit des Ver deutscher Ing—Feg. 15, 1913. No. 40539 D.

Locomotive Lubricants

Graphite as a Lubricant for Locomotives. L. H. Snyder. Explains the advantages and some of the special uses of flake graphite. 1800 w. Ry Mas Mech—Dec., 1912. No. 38258 C.

Locomotive Performance

Recent French Locomotive Performances. J. T. Burton-Alexander. A record of the work of the newest engines on important roads. 3000 w. Engr, Lond—Sept. 26, 1913. No. 45746 A.

Locomotive Practice

Modern Locomotive Practice in Europe and America. Lawford H. Fry. Read before the Inst. of Loc. Engrs. Shows the important types and sizes used by the principal railways and gives an idea of the general trend of locomotive practice at the beginning of the year 1913. 3000 w. Mech Engr—April 25, 1913. No. 41922 A.

Locomotive Repairs

Repairing Locomotive Driving Boxes. M. D. Franey. Considers brasses cast in place are better both as to service and cost of repairs. 2500 w. Am Engr—April, 1913. No. 41092 C.

Locomotives

Locomotives of the A., T. & S. F. Ry. Illustrates and describes types showing the tendency to introduce locomotives of increased size and power. 2200 w. Eng News—Nov. 7, 1912. No. 37313.

Superheater Locomotives for New South Wales. Illustrations of passenger and goods engines, with description. 500 w. Engr, Lond—Nov. 8, 1912. No. 37649 A.

Passenger Locomotives in European Countries (Die Personenlokomotiven der europäischen Staaten). Richard Baecker. Chief characteristic of the types on the leading continental roads. Ills. Serial. 1st part. 4400 w. Zeit d Oest Ing u Arch Ver—Oct 18, 1912. No. 37439 D.

1-F-1 Superheater Tank Locomotive for the Dutch Railway in Java (1 F 1-Heissdampf-Tenderlokomotive der holländischen Staatsbahn auf Java). Herr Metzeltin. Detailed description and comparison with similar types. Ills. 3600 w. Zeitschr des Ver deutscher Ing—Nov. 23, 1912. No. 38449 D.

Locomotive Engineering. A review of engines built during 1912. Ills. 3300 w. Engr, Lond—Jan. 3, 1913. No. 39167 A.

An Industrial Locomotive Driven by a Crude Oil Engine. Illustrated descrip-

tion of a locomotive for haulage service in the nitrate industry, Chili. 1800 w. Eng News—Jan. 9, 1913. No. 38948.

Locomotive Power on Narrow Gauge Railways. A comparison between the power of narrow-gauge locomotives used on colonial railways, and the stock of English railways, and the broader gauges of India and South America. Ills. 600 w. Engr, Lond—Dec. 27, 1912. No. 38903 A.

Locomotives for the Associated Lines. Reviews the common standard designs changed to include the Walschaert valve gear and superheaters. Ills. 1000 w. Am Engr—Jan., 1913. No. 38964 C.

New Great Central Locomotives. Illustrated description of an engine to be exhibited at the Ghent exhibition. 700 w. Ry Gaz, Lond—Jan. 17, 1913. No. 39466 A.

New Locomotives for the Sicilian Fruit Trade. Drawings and description of engines to be placed on the road to meet the requirements. 500 w. Engr, Lond—Dec. 20, 1912. No. 38900 A.

Oil-Burning Switching Locomotives for the Baltimore & Ohio R. R. Illustrated description of engines of exceptional design. 500 w. Ry & Engng Rev—Dec. 28, 1912. No. 38704.

Side-Tank Locomotive for the London-derry and Lough Swilly Railway Company. Illustration with brief description. 300 w. Engng—Jan. 10, 1913. No. 39265 A.

Some Notes on British Locomotives (Quelques notes sur les locomotives anglaises). L. Fort. Reviews the general characteristics of recently built types. Ills. Serial. 1st part. 7000 w. Rev Gen des Chemins de Fer—Jan., 1913. No. 39082 G.

Recent Locomotive Practice. A brief survey of the lines on which development has taken place. 1500 w. Mech Wld—Feb. 14, 1913. Serial, 1st part. No. 40125 A.

Adhesion and Rack Locomotives on the Italian State Railway. Luigi Velani. Reviews the history of the origin and evolution of the locomotive with artificial adhesion, giving a summary of rules for driving mixed adhesive locomotives and for service on rack sections. Ills. 6900 w. Bul Int Ry Cong—Feb., 1913. No. 40165 G.

New Type of Engine for the Great Central Railway. Illustration and description of the first of six powerful engines, designed for the heaviest and fastest express service. 600 w. Engr, Lond—Jan. 31, 1913. No. 39818 A.

Locomotive Development on the Prus-

Consult Classification of the Index. See page 9.

Locomotives

MOTIVE POWER AND EQUIPMENT

Locomotives

sian-Hessian State Railway and Some Results obtained in Practice with Superheated-Steam Locomotives. E. Meyer. Summary of a lecture given by Mr. Hammer, published in the *Ann. für Gewerbe und Bauwesen*. 5300 w. Bul Int Ry Cong—March, 1913. No 40917 G.

Baldwin Locomotives Built During 1912. Considers tendencies in design and construction of freight and passenger power as shown by a survey of last year's output. 3000 w. Ry Age Gaz—March 28, 1913. No. 40942.

British Locomotives in 1912. J. F. Gairnes. Discusses the designs and work. Ills. 6800 w. Bul Int Ry Cong—April, 1913. No. 41682 G.

Locomotives for the Chicago & Western Indiana R. R. Illustrated detailed description of recently built locomotives, equipped with superheater, brick arches, and Baker valve gear. 500 w. Ry & Engng Rev—April 5, 1913. No. 41114.

The L. & N. W. Locomotive. Sir Gilbert Claughton. Illustration and brief description of a 4-cylinder non-compound passenger engine. 400 w. Engr, Lond—April 11, 1913. No. 41397 A.

Compound Locomotives, Types Consolidation and Décapod, for the Chemin de fer du Nord (Note sur les locomotives compound, types "Consolidation," et "Décapod," de la Compagnie du Chemin de fer du Nord). M. Bonnin. Dimensions and features in design. Drawings. 3000 w. Rev gen des Chemins de Fer—Apr., 1913. No. 41517 G.

New Italian Locomotives—Group 685. Illustrations and brief description of four-cylinder "Prairie" type express locomotives for the Italian State Railways. 400 w. Engr, Lond—May 2, 1913. No. 42012 A.

The Oldest Engine on the Northern of France Railway. A. R. Bennett. Illustrated description of engine built in 1847 and altered in 1877 which is still at work. 500 w. Ry Gaz, Lond—June 13, 1913. No. 43134 A.

The L. and N. W. Locomotive. Sir Gilbert Claughton. Plate, illustrations and brief description. 200 w. Engr, Lond—June 6, 1913. No. 42891 A.

Express Passenger Locomotive Paris-Lyons-Mediterranean Railway. Illustrated description of a locomotive being shown at the Ghent Exhibition. Plate. 1500 w. Engng—May 16, 1913. No. 42537 A.

Three-Cylinder Locomotives. J. Snowden Bell. Extracts from a paper read before the Ry. Mas. Mech. Assn. An account of the origin and development of three-cylinder locomotives. 6000 w. Ry & Engng Rev—June 21, 1913. No. 43154.

Fourteen-Wheeled (1 F 1) Superheated-Steam Tank Locomotive of the Java State Railway. Mr. Metzeltin. Illustrated detailed description of a new design aiming at increase in power and reduction in cost of upkeep, with other advantages in construction and working. 3800 w. Bul Int Ry Cong—July, 1913. No. 43981 G.

New Switchers for the C. & N. W. Ry. and C., B. & Q. R. R. Illustrates and describes two superheater switches. 1000 w. Ry & Loc Engng—July, 1912. No. 43401 C.

British Locomotives in 1912 (Les Locomotives Britanniques en 1912). L. Pierre-Guédon. A brief review of types and their actual services. Ills. 2200 w. Genie Civil—June 21, 1913. No. 43575 D.

The Locomotives at the Ghent Exposition (Les Locomotives à l'exposition de Gand). L. Pierre-Guédon. This first part illustrates and describes locomotives exhibited by the Chemins de fer de l'Est. Plate. Serial, 1st part. 3700 w. Genie Civil—July 12, 1913. No. 43580 D.

Some Recent American Locomotives. Describes engines representative of regular American locomotives for heavy traffic conditions. Ills. 3000 w. Engr, Lond—Aug. 8, 1913. Serial, 1st part. No. 44463 A.

Special Features of New Locomotives for the Atchison, Topeka & Santa Fe Ry. Illustrated description of features of interest in new 4-cylinder balanced compound passenger engines, and freight engines of the 2:8:2 class. 1200 w. Eng. News—Aug 14, 1913. No. 44368.

Heavy Power for the Northern Pacific. Illustrated description of new locomotives and the work they are doing. 1200 w. Ry Age Gaz—Aug. 29, 1913. No. 44808.

An Important Locomotive Development. Illustrates and describes a large French decapod locomotive for use in the French coalfields. 1000 w. Sci Am Sup—Oct. 11, 1913. No. 45758.

Huge Decapod Locomotives for Service in the French Coalfields. Illustrated description of locomotives used on the Northern Ry. of France, for hauling heavy mineral train-loads over unusually severe gradients. 900 w. Ir & Coal Trds Rev—July 25, 1913. No. 44193 A.

The Sulzer-Diesel Locomotive. Illustrated detailed description of a Diesel-engined locomotive built for the Central Railway Department of the Prusso-Hessian State Ry., Berlin, designed for fast traffic. Also editorial. 3500 w. Engng—Sept. 5, 1913. No. 45154 A.

Locomotives

MOTIVE POWER AND EQUIPMENT Locomotives (Articulated)

The First Diesel Locomotive. Illustrated detailed description of this Diesel-motor operated locomotive for express service on the Berlin-Magdeburg line. 2000 w. Sci Am—Sept. 20, 1913. No. 45231.

The First Diesel Locomotive. Illustrated description and drawings of the first railway locomotive operated by a Diesel crude-oil engine. Also editorial. 3500 w. Eng News—Oct. 2, 1913. No. 45651.

Gasoline Freight and Switching Locomotive. Illustrated description of a locomotive for the Minneapolis and Northern Ry., having a maximum capacity of about 20 freight cars. 1500 w. Ry Mas Mech—Sept., 1913. No. 45238 C.

Inspection Locomotive on the Reading. Characterized by a boiler of small size and large capacity and a large observation room. Ills. 1000 w. Ry Age Gaz (Mech Ed)—Sept., 1913. No. 44956 C.

Ten Wheel Type Locomotive for the St. Louis Southwestern. Gives illustrations, dimensions, and brief description of ten-wheel 4-6-0 type, and consolidation 2-8-0 type. 1000 w. Ry & Loc Engng—Sept., 1913. No. 44855 C.

Powerful Locomotives for the Compagnie Bone-Guelma et Prolongements (Note sur les locomotives puissantes de la Compagnie Bone-Guelma et Prolongements). M. L. Felix. Brief general description of stock for heavy mineral transport in Tunis. Ills. and Plates. 1200 w. Rev Gen des Chemins de Fer—Aug., 1913. No. 45312 G.

Locomotives at the Ghent Exhibition (Les locomotives à l'exposition de Gand). L. Pierre-Guédon. General description of types exhibited by two French railways. 1500 w. Genie Civil—Aug. 16, 1913. No. 45350 D.

Great Southern & Western Railway Express Passenger Locomotives. Illustrated description. 700 w. Ry Gaz, Lond—Sept. 26, 1913. No. 45733 A.

New Locomotives for the Santa Fe. Illustrated description of a Pacific type locomotive with 6-wheel tender trucks, and a mikado type locomotive. 1300 w. Ry Age Gaz (Mech Ed)—Oct., 1913. No. 45665 C.

Innovations on the Locomotives of the Prussia-Hesse State Railways (Neuerungen an Lokomotiven der preussisch-hessischen Staatseisenbahnen). G. Hammer. Describes the testing apparatus, temperature recorders, etc., recently installed. Ills. Serial, 1st part. 3500 w. Glaser's Ann—Oct. 1, 1913. No. 46016 D.

See also Superheating, under *Motive Power and Equipment*.

Locomotives (Articulated)

Powerful 2-8-8-0 Type Locomotive. Illustrated description of Mallet locomotives, having a 100,000-pound tractive effort when working compound, in use on the Great Western. 2500 w. Am Engr—Nov., 1912. No. 37308 C.

A Study on Mountain Locomotives, and Especially Compound Articulated Locomotives. Mallet System (Étude sur les locomotives de montagne et particulièrement la locomotive compound articulée, système Mallet). M. A. Mallet. Chapters on locomotive adhesion, adhesive weight and tractive effort, curve effects, wheel bases, early systems, articulation, Mallet system, and usage in the United States. Ills. 194 pp. Mem Soc Ing Civ de France—Aug., 1912. No. 37484 G.

Mallet Articulated Compound Locomotive (2-8-8-0 Type); G. N. R., U. S. A. Illustrated description of engines for the Great Northern Ry. 900 w. Engng—Nov. 29, 1912. No. 38129 A.

Single Mallet for High Speed. G. I. Evans. Illustrated description of an articulated locomotive with four equal size cylinders grouped at the center of the wheel base and designed for speeds up to 50 miles per hour. 2500 w. Ry Gaz, Lond—Dec. 13, 1912. No. 38386 A.

New Garratt Locomotives, Tasmanian Government Railways. Illustrations and descriptions of new types, fitted with Schmidt's superheating apparatus. 2000 w. Ry Gaz, Lond—Jan. 3, 1913. No. 39145 A.

Mallet Compound Locomotives for the Missouri, Oklahoma & Gulf Ry. Illustrated description of articulated locomotives of the 2-6-6-2 type. 1000 w. Ry & Engng Rev—Jan. 4, 1913. No. 38837.

2-6-6-2 Tank Locomotive With Superheater for the Java Railway (Locomotive-tender à six essieux couplés et à surchauffe, des Chemins de fer de Java). Detailed description of this locomotive. Ills. and plate. 1500 w. Génie Civil—Dec. 14, 1912. No. 39085 D.

A Heavy Switching Locomotive with Side Sandboxes. Illustrated description of a Mallet shifting locomotive with four sandboxes mounted at the sides of the boiler, in use at Lorain, O. 500 w. Eng News—Feb. 6, 1913. No. 39705.

Mallet Locomotives on the Harzquer and Brocken Ry. (Die Mallet-Lokomotive der Harzquer-und Brockenbahn). Details of construction. Ills. and Plate. 5500 w. Zeitschr des Ver deutscher Ing—Jan. 25, 1913. No. 40044 D.

Locomotives for the Rhodesian Railways. Illustrated description of the lat-

Locomotives (Atlantic) MOTIVE POWER AND EQUIPMENT Locomotives (Electric)

est development in these narrow gauge locomotives. 500 w. Engr, Lond—March 7, 1913. No. 40713 A.

Distribution of Power in Mallets. Paul Weeks. Considers valve setting and cylinder ratios when the weight on the two groups of drivers is unequal. 2500 w. Am. Engr—May, 1913. No. 41835 C.

Notes on Articulated Locomotives (Note sur les locomotives articulées). Lionel Wiener. A comprehensive review of the three main groupings of articulated locomotives, and the special types under each main head. Ills. Serial, 1st part. 52 pp. Rev gen des Chemins de fer—May, 1913. No. 42185 G.

Mallet Compound Locomotive for the Pennsylvania R. R. Illustrated description of an engine of the 0-8-8-0 type, primarily intended for pushing service. 1000 w. Ry & Engng Rev—July 26, 1913. No. 43938.

Mikado and Mallet Type Locomotives for the Northern Pacific Ry. Illustrates and describes examples of the 2-8-2 type and 2-8-8-2 type recently delivered. 1200 w. Ry & Engng Rev—Sept. 6, 1913. No. 45055.

Powerful Articulated Narrow Gauge Locomotives for Tasmania. Illustrates and describes new types designed for operation on a gauge of 3½ ft. 1000 w. Sci Am Sup—Sept. 20, 1913. No. 45233.

Simple Articulated Locomotives for the Antafogasta & Bolivia Ry. Illustrated description of engines and tender. 700 w. Ry & Engng Rev—Oct. 25, 1913. No. 46219.

See Locomotives (Electric), under *Motive Power and Equipment*.

Locomotives (Atlantic)

Tests of an Atlantic Type Passenger Locomotive, Pennsylvania R. R. A report of the tests on a superheater Atlantic type locomotive made at Altoona, Ills. 4500 w. Ry & Engng Rev—Aug. 2, 1913. Serial, 1st part. No. 44150.

Locomotives (Diesel)

Diesel Locomotive Built by Sulzer Bros. Illustrated description of this locomotive for the Prussian-Hessian State Rvs. 700 w. Ry Gaz, Lond—Oct. 3, 1913. No. 45847 A.

The First Thermo-Locomotive (Die erste Thermo-Lokomotiv). F. Sternberg. Detailed description of the first Diesel-engined locomotive. Ills. 3300 w. Zeit des Ver deutscher Ing—Aug. 23, 1913. No. 46034 D.

Locomotives (Electric)

Alternate-Current Locomotive of 1500 H.P. Dr. van Cauwenbergh. Abstract trans. from *Elek. Zeit*. Illustrated description of the design. 1200 w. Elect'n, Lond—Jan. 31, 1913. No. 39777 A.

The New Gas-Electric Locomotive of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company. General view and description of a locomotive to be put in service about May 1st, on an electric suburban railroad, with statement of economic advantages expected. 1500 w. Engng & Con—Feb 5, 1913. No. 39704.

A French Single-Phase Locomotive. Illustrates and describes a 1500-h.p. locomotive being tried by the Midi Ry. 1500 w. Elec Ry Jour—Feb. 15, 1913. No. 39878.

Maintenance of the Pennsylvania Railroad Electric Locomotives. Illustrated description of the methods used in the inspection and repair of the side-rod type of locomotive equipped with jack shafts. 7500 w. Elec Ry Jour—March 15, 1913. No. 40682.

Accumulator Mine Locomotives (Locomotiva elettriche ad accumulatori per miniere). J. Rechtenwald. A review of present types. Ills. Serial. 1st part. 1800 w. Industria—Feb. 2, 1913. No. 40611 D.

Articulated Electric Locomotives for the New York Central. Illustrated description of the eight-motor articulated, 600-volt direct-current electric locomotives placed in service. 1500 w. Ry Age Gaz—April 11, 1913. No. 41175.

Most Powerful Electric Locomotives in the World. N. Y. C. & H. R. R. R. Illustrated description of the 600 volt, direct-current locomotives and related information. 3000 w. Ry Mas Mech—May, 1913. No. 42203 C.

1-C-1 Locomotives, Group 032 of the Italian Railways (1-C-1 Lokomotiven, Gruppe 032 der Italienischen Staatsbahnen). J. Buchli. Details of the mechanical and electrical construction and equipment. Ills. 2400 w. Elek Kraft u Bahnen—April 24, 1913. No. 42158 D.

The Thomson-Houston Electric Locomotive System for the Compagnie des Chemins de fer du Midi (Locomotive électrique système Thomson-Houston de la Compagnie des Chemins de fer du Midi). J.-A. Montpellier. Details of the electrical equipment of these thoroughly satisfactory types. Ills. 6600 w. Tech Mod—April 15, 1913. No. 42173 D.

Direct-Current, 2400-Volt Locomotives for Butte, Anaconda & Pacific Railway. Illustrated description of locomotives of the articulated double-truck type with all weight on the drivers. 1800 w. Elec Rev & W Elect'n—June 14, 1913. No. 42846.

A 2400-Volt Direct-Current Locomotive; Butte, Anaconda & Pacific Railway. Illustrated description of work of

Consult Classification of the Index. See page 9.

Locomotives (Electric) MOTOR POWER AND EQUIPMENT Locomotives (Mikado)

the locomotives. 1500 w. Eng News—June 26, 1913. No. 43311.

800-H.P. Locomotives for the Mittenwald Railway (Die 800 PS=Lokomotiven der Mittenwaldbahn). Egon Seefehlner and Franz Popp. Detailed description of these locomotives, covering their construction and electrical equipment. Ills. and Plate. 5500 w. Elek u Masch—May 4, 1913. No. 43037 D.

Coupling Frames and Connecting Gearing as Driving Mediums for Electric Locomotives (Der Kuppelrahmen und verwandte Getriebe als Antriebsmittel für elektrische Lokomotiven). Herr Kleinow. A study of the wheel couplings on electric locomotives of differing types. Ills. 5600 w. Elek Kraft u Bahnen—June 14, 1913. No. 43545 D.

Motive Equipment of the Departmental Railways of Haute-Vienne (Die Triebwagenausrüstungen der Chemins de Fer départementaux de la Haute-Vienne). A. Wichert. Territory covered, power production and distribution, and details of locomotive equipment. Ills. 6500 w. Elek Kraft u Bahnen—Aug. 14, 1913. No. 44685 D.

Electric Locomotives for Main Line and Suburban Services. B. Parker Haigh. Read before the Sci. Soc. of the Roy. Tech. College, Glasgow. Deals with matters of design and construction. Ills. 3500 w. Mech Engr—Aug. 29, 1913. Serial, 1st part. No. 45036 A.

Electrical Locomotives of the Lötschberg Railway. Illustrated detailed description of probably the most powerful locomotives yet built. 1500 w. Elec Rev, Lond—Aug. 29, 1913. No. 45028 A.

The Split-Phase Locomotive. E. F. W. Alexanderson. Describes and explains features of control of this novel type of electric locomotive. Ills. 2500 w. Gen Elec Rev—Oct., 1913. No. 45580 C.

New Single-Phase Motor and Phase converter for Locomotive Service. Illustrates and describes an experimental type of articulated locomotive with single-phase commutator motors. 2500 w. Elec Ry Jour—Oct. 11, 1913. No. 45881.

Single-Phase Locomotives for the Rhaetian Railway. Illustrates and describes the electric locomotives for this single-phase line in Switzerland. 900 w. Engr, Lond—Oct. 3, 1913. No. 45865 A.

Interurban Electric Locomotives. D. H. Ackerson. Gives a comparison of characteristics and performance of high and low speed motors and related matters. Ills. 2500 w. Elec Jour—Oct., 1913. No. 46335.

The Selection of Electric Locomotives. L. M. Aspinwall. Considers the characteristics required for different classes of

service. Ills. 2000 w. Elec Jour—Oct., 1913. No. 46327.

New Passenger and Freight Locomotives on the New York, New Haven and Hartford, and Boston and Maine Railways (Neuere Personenzugs- und Güterzuglokomotiven der New York, New Haven and Hartford-Bahn und Boston und Maine-Bahn). R. E. Hellmund. Detailed description of the several new types in the service of these roads. Ills. Serial, 1st part. 7500 w. Elek Kraft u Bahnen—Sept. 14, 1913. No. 46091 D.

See also Motor Cars, under *Motive Power and Equipment*.

Locomotives (Mikado)

Mikado Locomotives for the Chicago, Rock Island & Pacific Ry. Illustrated description of the essential features. 600 w. Ry & Engng Rev—Nov. 23, 1912. No. 37799.

Large Mikados for the Rock Island. Illustrated description of locomotives of the 2-8-2 type which are proving satisfactory from the standpoint of economy. 1000 w. Am Engr—Nov., 1912. No. 37304 C.

Mikados for the Burlington. Illustrated description of the 2-8-2 type with Emerson superheaters. 1100 w. Am Engr—Dec., 1912. No. 38201 C.

Mikado Locomotives for the Burlington. Illustrated description of engines designed for long freight runs. 500 w. Ry Age Gaz—Nov. 29, 1912. No. 37947.

Mikado Type of Locomotives for the Woodward Iron Company. Illustrated description. 800 w. Ry & Loc Engng—Dec., 1912. No. 38013 C.

Large Mikados for the Lake Shore. Illustrated description of the heaviest Mikado type locomotives which are to replace consolidation type locomotives. 2800 w. Am Engr—May, 1913. No. 41834 C.

Mikado Locomotive for the Lake Shore & Michigan Southern Ry. Illustrated description of engines recently put in service. 1200 w. Ry & Engng Rev—May 10, 1913. No. 41978.

Powerful Mikado for the Lake Shore. Illustrates and describes interesting details of these heavy engines. 1200 w. Ry Age Gaz—May 2, 1913. No. 41802.

Mikado Type Locomotive, Philadelphia & Reading Ry. Illustrated description of what is claimed to be the largest Mikado type locomotive yet constructed. 1800 w. Ry & Engng Rev—June 7, 1913. No. 42708.

Powerful Mikado on the Reading. Illustrated description of the largest engine of this type, showing exceptional frame bracing and absence of superheater. 1000 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44261 C.

Consult Classification of the Index. See page 9.

Locomotives (Pacific) MOTIVE POWER AND EQUIPMENT**Lubrication**

Mikado and Pacific Locomotives for the Duluth & Iron Range. Illustrations and particulars of these types. 1500 w. Ry & Loc Engng—Aug., 1913. No. 44106 C.

See Locomotives (Articulated), under *Motive Power and Equipment*.

Locomotives (Pacific)

Pacific and Mikado Type Locomotives for the New Orleans, Mobile & Chicago R. R. Illustrates and describes the essential features of these new locomotives. 1000 w. Ry & Engng Rev—Dec. 7, 1912. No. 38099.

Pacific and Consolidation Locomotives for the Pere Marquette. Illustrates and describes both types. 700 w. Ry & Loc Engng—Jan., 1913. No. 38798 C.

Canadian Pacific 4-6-2 Type Locomotive. W. H. Winterrowd. Illustrated detailed description of the standard Pacific type locomotive with enclosed vestibule cab and a combined tender tank and underframe. 1500 w. Am Engr—March, 1913. No. 40339 C.

Pacific Type Locomotives for the Nashville, Chattanooga & St. Louis Ry. Illustrated description of engines of high-powered design for passenger service. 700 w. Ry & Engng Rev—June 21, 1913. No. 43152.

The Locomotives of the Compagnie P.-L.-M. at the Gand Exposition (Les locomotives de la Compagnie P.-L.-M. à l'exposition de Gand). L. Pierre-Guédon. Leading particulars on the Pacific locomotives exhibited. Ills. and Plate. 3000 w. Genie Civil—May 24, 1913. No. 43084 D.

Pacific Type Locomotives for the Baltimore & Ohio R. R. Illustrates and describes the essential features. 800 w. Ry & Engng Rev—Sept. 20, 1913. No. 45272.

Pacific Type Locomotive for the Pennsylvania Lines West of Pittsburgh. Illustrated description of a heavy fast passenger locomotive—the 40,000th locomotive to be built by the Baldwin Works. 1200 w. Ry & Engng Rev—Oct. 4, 1913. No. 45685.

Locomotive Selection

Factors in the Selection of Locomotives in Relation to the Economics of Railway Operation. O. S. Beyer, Jr. Discusses things to be considered in the selection, sizes and types, the relation of operating expenses, and the determination of the most economical locomotive, etc. 8000 w. Jour Am Soc of Mech Engrs—Jan., 1913. No. 39349 D.

Locomotive Superheaters

The Locomotive Superheater and Some of Its Effects on the Cost of Railway Operation. Gilbert E. Ryder. Illustrates

and describes the arrangement and explains the savings effected. General discussion. 13800 w. Pro N Y R R Club—Nov. 15, 1912. No. 38623.

The Maintenance and Operation of Superheater Locomotives. Gilbert E. Ryder. Presents the problems in the operation and maintenance of superheater locomotives. General discussion. Ills. 15500 w. Pro Ry Club of Pittsburgh—Feb. 28, 1913. No. 41549 C.

Some Effects of Superheating and Feed-Water Heating on Locomotive Working. F. H. Trevithick and P. J. Cowan. Considers these systems and their economical features, the value of the systems and their practical features. Ills. 12000 w. Inst of Mech Engrs—March 14, 1913. No. 41014 N.

Lubrication of Superheated Locomotives. James Spelten. Explains conditions and their causes, as observed by the writer. 1500 w. Ry & Loc Engng—April, 1913. No. 41032 C.

The North-Eastern Railways Stump Locomotive. Illustrated description of the six-wheel coupled express goods locomotive recently placed in service. 800 w. Engr, Lond—April 18, 1913. No. 41777 A.

See Superheating, under **MECHANICAL ENGINEERING, Steam Engineering**.

Locomotive Testing

The Progress in Testing Full-Size Pieces Under Practical Conditions, Together with Locomotive Testing in the United States. Gaetano Lanza. Outlines the progress made and the present status of such tests. Ills. 7500 w. Jour Fr Inst—Dec., 1912. No. 38394 D.

See Laboratory, under **MECHANICAL ENGINEERING, Measurement**.

Locomotive Valves

The Measurement of the Steam Discharge from Locomotive Pop Safety Valves. Discusses the tests carried out by Edward F. Miller, Prof. of Steam Engng. at the Mass. Inst. of Tech., conducted on Crosby muffed pop locomotive safety valves and every precaution taken to secure accuracy. 1200 w. Engng—Jan. 17, 1913. No. 39479 A.

New York Triple Valves. Illustrates and describes triples of the K type for freight service. 2000 w. Ry & Loc Engng—Jan., 1913. No. 38797 C.

Maintenance of Piston Valves. Illustrates and describes methods used in machining packing rings and bushings on the Eastern Ry. of France. 2500 w. Am Engr—Dec., 1912. No. 38204 C.

Lubrication

Locomotive Lubrication. W. W. Lemen. Discusses lubricants and their applica-

Consult Classification of the Index. See page 9.

Mechanical Stokers

MOTIVE POWER AND EQUIPMENT

Multiple-Unit

tion and related topics. 8500 w. Ry Mas Mech—Feb., 1913. No. 39924 C.

Mechanical Stokers

Mechanical Stokers from Operating Standpoint. Reports heavy trains successfully operated on four large roads by locomotives equipped with these machines. 2500 w. Ry Age Gaz—June 13, 1913. No. 42815.

Mine Locomotives

See same heading, under MINING AND METALLURGY, Mining.

Motor Cars

New Benzol - Electric Motor Cars (Neuere benzolelektrische Triebwagen). W. Wechmann. Describes motor equipment and electric installations for these cars. Ills. 2600 w. Elek Kraft u Bahnen—Oct. 24, 1912. No. 37468 D.

Petrol-Electric Motor Cars, H. Pieper System (Automotrices pétroleo-électriques, système H. Pieper). Marcel Hegelbacher. Detailed description of this type of railway motor car. Ills. and plate. 2600 w. Génie Civil—Jan. 11, 1913. No. 39091 D.

The History of the Railway Motor Car (Die Geschichte der Eisenbahntriebwagen). C. Guillery. Recording the stages of development to the present time. Ills. 3600 w. Mitt d Ver f d Förd des Lokal u Strassenbahnwesens—Mar., 1913. No. 41471 F.

Motor Cars in the Service of the Prussian-Hessian Railways (Die Triebwagen im Dienst der preussisch-hessischen Staatsbahnen). Herr Usyand. The value, in general, of electric motor cars, and the construction characteristics of the types used on this system. Serial, 1st part. 6000 w. Elek Kraft u Bahnen—May 4, 1913. No. 42159 D.

A British Gasoline-Electric Motor Car. Illustrated description of the Thomas Transmission gasoline-electric car which has been running on the South African Railways with satisfactory results. 1800 w. Ry & Engng Rev—May 31, 1913. No. 42578.

Railroading Without Steam. Don Cameron Shafer. Illustrated description of self-contained cars and notes on the change in transportation methods. 1200 w. Cassier's—June, 1913. No. 42865 B.

Self-Propelled Cars. S. T. Dodd and B. H. Arnold. Abstract of a paper read before the Int. Ry. Fuel Association. The discussion is confined largely to the heavier types of independent cars. 4500 w. Ry Age Gaz (Mech Ed)—June, 1913. No. 42685 C.

Self-Propelled Railway Passenger Cars. S. T. Dodd. Illustrates and describes various types of cars, comparing the characteristics of the mechanical drive

gasoline car and the electric-drive gasoline car, and the operating costs. 5000 w. Gen Elec Rev—Sept., 1913. No. 44831 C.

Shunt-Wound Motor Cars and Their Use on Mountain Lines (Nebenschluss-trieb-wagen und ihre Verwendung auf Gebirgstrecken). Herr Reutener. Describes these cars and their service on some German roads. Ills. 3300 w. Elek Kraft u Bahnen—May 14, 1913. No. 43047 D.

Motor Cars for Maintenance of Way Forces. A study of the service of over 3500 cars on 60 roads. Reports general satisfaction where properly used. Table and editorial. 5000 w. Ry Age Gaz—July 18, 1913. No. 43799.

The Possibilities of Motor Vehicles for Railway Purposes from the Operator's Standpoint. J. Pepper. Discussion of the economical collection and delivery of goods, and the cost of operating different types of motor vehicles. 9500 w. Ry Age Gaz, Lond—July 4, 1913. No. 43708 A.

Petrol-Electric Motor Cars (Automotrices Pétroleo-Électriques). M. Damoiseau. General descriptions of the many different systems and types of self-propelled tram cars in France. Ills. 14000 w. Bul Soc Int d Electriciens—May, 1913. No. 43567 F.

Motor Car Troubles, Their Symptoms, Causes and Remedies. Notes from an instruction book recently issued by the Union Pacific. 1800 w. Ry Age Gaz—Aug. 15, 1913. No. 44409.

Petrol-Hydraulic Railway Motor Coach. Illustrated description of a motor coach built for service in Canada in which the Hele-Shaw hydraulic power transmission system has been combined with an internal combustion engine. 1200 w. Engr, Lond—Aug. 8, 1913. No. 44465 A.

The Dracar. Illustrated description of a self-propelled passenger car using a gasoline engine to drive an electric generator as a prime mover, with the electrical energy transmitted to motors geared to the axles. 800 w. Ry & Loc Engng—Oct., 1913. No. 45597 C.

Benzol Electric Train for the Khedive of Egypt. Illustrated description of a train composed of two motor coaches, each equipped with a benzol electric set. 1000 w. Engr, Lond—Sept. 5, 1913. No. 45158 A.

Multiple-Unit

The New Multiple-Unit Rolling Stock of the Ouest-Etat Railway. Illustrated description of new rolling stock. 2200 w. Elect'n, Lond—June 6, 1913. No. 42881 A.

Official Records

MOTIVE POWER AND EQUIPMENT

Shops

Official Records

Forms for Locomotive Operation and Cost. A. V. Heckman. Describes a system of records that give a true index of shop and roundhouse conditions. 4000 w. Am Engr—March, 1913. No. 40341 C.

Oil Engines

The Oil Engine in Railway Water Service. C. R. Knowles. Considers types of engines used for this service, their care, economy, etc. 2000 w. Ry Age Gaz—Aug. 15, 1913. No. 44406.

Passenger Cars

The Construction of Iron Passenger Cars on Railways in the United States of America. F. Gutbrod. Gives reasons for their adoption, their history, comparing with existing cars, etc. Ills. 9500 w. Bul Int Ry Cong—Nov., 1912. Serial. 1st part. No. 37708 G.

Steel Passenger Cars. A. Copony. Read before the Can. Ry. Club. Discusses their construction, maintenance, cost and weight, insulation, inside finish, etc. 9000 w. Ry Mas Mech—Nov., 1912. No. 37342 C.

The New Cars for the Bona-Guelma and Extension Railway (Les Nouvelles Voitures de la Cie de Bône-Guelma et prolongements). M. Felix. Describes type of construction, and 1st, 2nd and 3rd class compartment arrangements. Ills. and plates. 1200 w. Rev Gen des Chemins de Fer—1912. No. 37492 G.

Power Resources

Steam Power and Other Sources of Energy in Future Transportation (Die Dampfkraft und andere Energiequellen im zukünftigen Transportwesen). Leopold Kliment. A study of the indications toward future sources of power. Serial. 1st part. 5400 w. Zeit d Oest Ing u Arch Vereines—Dec. 6, 1912. No. 39048 D.

Refrigerator Cars

Transportation of Fruit and Vegetables. E. D. Levy. Abstract of an address before the Western Fruit Jobbers' Assn. Discusses the service and the need for co-operation between shipper and carrier. 5000 w. Ry Age Gaz—Feb. 7, 1913. No. 39712.

Relief Trains

The Relief Trains of the Baden State Railway. Mr. Courtin. Describes in detail this recently introduced feature. Ills. 5000 w. Bul Int Ry Cong—May, 1913. No. 42262 G.

Repair

The Repair and Maintenance of Railway Motive Power from Practical Experience (Ueber Instandsetzung und Unterhaltung der Eisenbahn-Betriebsmittel nach in der Praxis gemachten Erfahrungen). A. Diekmann. Maintains that

long life depends upon: solid construction; manipulation, and careful study and repair by experienced men in the shop. 5000 w. Gläser's Ann—May 15, 1913. No. 43018 D.

Repair Shops

System as Applied to Shop Repairs to Locomotives. A. H. Kendall. A résumé of the system in use at the Angus shops of the Canadian Pacific. 5000 w. Ry Mas Mech—Sept., 1913. No. 45239 C.

Safety Valves

Location of Steam Gages in Setting Safety Valves. C. T. Rommel. Gives results obtained from tests. 1800 w. Ry Age Gaz (Mech Ed)—Oct., 1913. No. 45667 C.

Shop Practice

Setting Eccentrics Upon Locomotive Crankshafts. Describes a practical workshop method of setting out the eccentric sheaves upon the crankshaft. Ills. 1000 w. Mech Wld—Dec. 27, 1912. No. 38885 A.

Methods in a Railroad Shop in Utah. F. A. Stanley. Illustrates and describes economical methods made possible by special tools. 1500 w. Am Mach—Jan. 9, 1913. No. 38943.

Shops

Building Large Locomotives. Illustrated description of the large erecting shop at Eddystone, Pa. 1500 w. Ry Age Gaz—Nov. 8, 1912. No. 37332.

Frog and Switch Shops of the C., M. & St. P. Illustrated description of the arrangement and operation of a large railway plant for the manufacture and repair of track material. 1200 w. Ry Age Gaz—Nov. 15, 1912. No. 37601.

Shops of the Cleveland, Cincinnati, Chicago & St. Louis Ry., Beach Grove, Ind. Illustrated detailed description of the plant, its arrangement and equipment. 4000 w. Ry & Engng Rev—Nov. 2, 1912. No. 37270.

Impressions of British Railway Practice. Henry W. Jacobs. Illustrates and describes practice at the railway shops of the L. & N. W. at Crewe, England. 2500 w. Ry Age Gaz—Nov. 15, 1912. No. 37598.

Calgary Shops, Canadian Pacific Ry. Illustrated description of this large plant of interest because of its size and the speed with which it was erected. 4500 w. Ry Mas Mech—June, 1913. No. 42854 C.

Canadian Pacific Railway Shops at Ogden, Alberta. Illustrated detailed description. 5000 w. Can Engr—May 29, 1913. No. 42627.

Determining the Type of Erecting Shop for Locomotive Repair Shops. P. L. Battey. Considers the organization more important than the type of shop. Differ-

Consult Classification of the Index. See page 9.

Smoke

MOTIVE POWER AND EQUIPMENT

Superheaters

ent authors discuss the good and bad features of various types. Ills. 7500 w. *Ry Mas Mech*—June, 1913. No. 42852 C.

Locomotive Repair Shops. F. F. Gaines. An analysis and discussion of the more important items relative to the construction and operation of repair shops. Ills. 3000 w. *Ry Mas Mech*—June, 1913. No. 42851 C.

The New Workshops of the Semarang-Cheribon Steam Railway Company (De nieuwe werkplaatsen der Semarang-Cheribon Stoomtram Maatschappij). J. H. Müller. Description of the equipment of this shop in Java. Ills. 3800 w. *De Ingenieur*—June 21, 1913. No. 43549 D.

Brighton Works of the London, Brighton and South Coast Ry. Hugh G. Boutell. Impressions from a recent visit to these shops. Illustrations of two locomotives. 1800 w. *Ry & Loc Engng*—Aug., 1913. No. 44105 C.

Jeffery Shops of the Western Pacific W. E. Johnston. Illustrated description of new shops at Sacramento, Cal., and their equipment. 3000 w. *Ry Mas Mech*—Sept., 1913. No. 45237 C.

The Manufacture of Rolling Stock in Australia. Brief account of the works of the Clyde Engng. Co., near Sydney, N. S. W. 1300 w. *Engr, Lond*—Sept. 12, 1913. No. 45405 A.

Smoke

The Abatement of Locomotive Smoke. D. F. Crawford. (Abstract.) Considers briefly the available methods for the abatement of smoke, and results obtained. 3000 w. *Ry Age Gaz*—Oct. 24, 1913. No. 46197.

Smoke Prevention

Chicago Terminals and the Smoke Problem. R. E. Pierce. A defense of the Chicago railroads against the demand for compulsory electrification of the railway terminals within the city, delivered in the Fuertes Memorial Prize-Speaking Contest, at Cornell Univ., April 18, 1913. 2000 w. *Ry & Engng Rev*—May 10, 1913. No. 41979.

The Railroad Man's Side of the Smoke Abatement Problem. G. M. Carpenter. Address before the Cincinnati Ry. Club. Shows that the same laws cannot be enforced in locomotive practice that are enforced in stationary practice. 3300 w. *Ind Wld*—May 12, 1913. No. 41967.

Smoke-Washers for Roundhouses. Drawings and description of a plant in Chicago, for washing the smoke discharged from locomotives in the engine house. 700 w. *Eng News*—May 15, 1913. No. 42093.

See also same heading, under **ME-**

CHANICAL ENGINEERING, Steam Engineering.

Snow Plows

Rotary Snow Plows. Notes from a paper by H. H. Vaughan, before the Can. Soc. of Civ. Engrs. Illustrates and briefly describes the development from the earliest type to the latest Canadian Pacific design. 1200 w. *Eng Rec*—Jan. 11, 1913. No. 38954.

Steam Consumption

The Steam Consumption of Locomotive Engines from the Indicator Diagrams. J. Paul Clayton. Develops and illustrates the application of the logarithmic diagram to locomotive engines. Univ of Ill, *Bul* 65—Jan 20, 1913. No. 42901 N.

Steel Cars

Steel Passenger Car Design. Papers and discussion presented at a meeting held in New York, April 8, 1913, conducted by the Sub-Committee on Railroads of the Committee on Meetings, the New York Local Committee cooperating. 13 papers by different authors. 21000 w. *Jour Am Soc of Mech Engrs*—May, 1913. No. 42409 D.

Interior Finish of All-Steel Coaches. Shows the reduction in weight from using steel instead of wood, and other advantages. Ills. 1500 w. *Ry Gaz, Lond*—May 23, 1913. No. 42747 A.

Steel Passenger Car Design. Discussion of the 13 papers on this subject, presented at the New York meeting on April 8. 2500 w. *Jour Am Soc of Mech Engrs*—June, 1913. No. 42955 D.

Stokers

The Standard Locomotive Stoker. Illustrated description of a new stoker, the prominent features being absence of apparatus in the cab and noiseless operation. 1200 w. *Ry Age Gaz*—Oct. 10, 1913. No. 45773.

Stores

Regulation of the Stock of Material. George G. Yeomans. Discusses the relation of accounting to this problem. The form of such accounts and ends to be served. 2200 w. *Ry Age Gaz*—April 4, 1913. No. 41071.

Superheaters

Stirling's Superheater for Locomotive Boilers. Illustrated description of a new design and statement of advantages claimed for it. 1500 w. *Mech Engr*—July 18, 1913. No. 43957 A.

Duchesne's Experiments on Superheat. R. C. H. Heck. A critical examination of Duchesne's results and methods. *Power*—July 22, 1913. No. 43843.

See also Locomotives, under **Motive Power and Equipment.**

Consult Classification of the Index. See page 2.

Superheating

MOTIVE POWER AND EQUIPMENT

Valve Gears

Superheating

Increase in Locomotive Capacity by the Use of Highly Superheated Steam. Gilbert E. Ryder. Claims that the superheated locomotive gives an increase in hauling capacity, a saving in fuel, and a reduction in cost of transportation. Discussion. 15500 w. Pro W Ry Club—Jan. 21, 1913. No. 40398 C.

Superheater Locomotives. P. C. Linck. Read before the Gen. Foremen's Assn. Suggestions for maintaining superheater locomotives for successful operation. Short discussion. 1500 w. Ry Age Gaz (Mech Ed)—Aug., 1913. No. 44262 C.

Tests of Superheater Locomotives. C. H. Benjamin and L. E. Endsley. Reports tests at Purdue University, describing methods and discussing results. 3500 w. Ry Mas Mech—Aug., 1913. No. 44469 C.

Tires

Wear of Driving-Wheel Tires. Editorial discussion of various contributing causes. 1000 w. Ry & Loc Engng—Nov., 1912. No. 37240 C.

Chrome-Vanadium Driving Wheel Tires. Reports service obtained, and gives specifications. Ills. 2000 w. Ry Age Gaz—Dec. 20, 1912. No. 38346.

See also same heading, under STREET AND ELECTRIC RAILWAYS.

Traction Effort

Locomotive Traction Effort. H. A. Houston. Gives the development of a formula which includes allowances for the limits to the physical strength of the fireman. 2000 w. Ry Age Gaz—Sept. 12, 1913. No. 45078.

Tractors

The Schneider Locotractor (Le Locotracteur Schneider & Cie.) E. Brillié. Description of a new internal combustion engine designed for heavy duty in railway motive work. Ills. 10,000 w. Mem Soc Ing Civ de France—April, 1913. No. 43079 G.

Schneider & Co. Locomotive; 70-Horsepower, Internal-Combustion Motor with Aerothermic Transmission, on the Hautier System (Locomotive Schneider et Cie., de 70 chevaux à moteur à explosion et transmission aérothermique, système Hautier). L. Pierre-Guédon. A new type of tractor fitted for railway locomotive purposes. Ills. 4800 w. Genie Civil—May 31, 1913. No. 43086 D.

Train Lighting

A New Dynamo for Train Lighting. Illustrated description of the machine and the principle on which it works. 2000 w. Engr, Lond—June 6, 1913. No. 42894 A.

Train Resistance

Characteristic Dynamical Diagrams for the Motion of a Train During the

Accelerating and Retarding Periods. W. E. Dalby. Considers a method of reducing data obtained from a dynamometer-car record in order to obtain information regarding vehicle and engine resistance, and related subjects. 9500 w. Inst of Mech Engrs—Oct. 25, 1912. No. 37397 N.

The Temperature Effect on Train Resistance. Refers to an investigation by E. C. Schmidt and F. W. Marquis and the conclusions. 2000 w. Engng—Jan. 10, 1913. No. 39258 A.

Starting Resistance of Railway Rolling Stock (Der Bewegungswiderstand von Eisenbahnfahrzeugen zu Beginn des Anfahrens) H. v. Glinski. Results of dynamometer tests on trains of varying loads. 2700 w. Zeitschr des Ver deutscher Ing—Dec. 21, 1912. No. 39040 D.

Transfer Trucks

Electric Transfer Trucks for Railways (Les chariots-transbordeurs électriques dans les chemins de fer). A. Frémieux. The general advantages of these trucks for freight transfer, their construction and electrical equipment. Ills. Serial, 1st part. 3600 w. Tech Mod—June 1, 1913. No. 43072 D.

Triple Valves

Will Triple Valves Operate as Intended? Abstract of a paper by S. W. Dudley, read before the Air Brake Assn. Considers the effect of different sizes of brake pipe, main reservoir pressures, compressor capacity, etc. 5000 w. Ry Age Gaz (Mech Ed)—June, 1913. No. 42684 C.

Valve Gears

The Baker Locomotive Valve Gear. R. S. Mounce. Illustrated description of the gear with an analysis of its motions and the methods of setting valves, to obtain best results. 2200 w. Am Engr—Nov., 1912. No. 37306 C.

The Baker Valve Gear. Discusses possible breakdowns. Ills. 1100 w. Ry & Loc Engng—April, 1913. No. 41029 C.

Valve Gear of Six-Coupled Bogie Express Locomotive for the Great Central Railway. Illustrated description of an interesting example of British locomotive practice. 2 plates. 500 w. Engng—Feb. 28, 1913. No. 40487 A.

Balances for Piston Slide Valves (Entlastung für Kolbenschieber). Friedr. Becher. A study of locomotive valves and their fittings. Ills. 3300 w. Zeit des Ver deutscher Ing—Feb. 1, 1913. No. 40534 D.

A Locomotive Valve Gear. C. F. Dendy Marshall. Illustrates and describes the author's invention of a valve gear for railway engines. 2500 w. Engr, Lond—June 20, 1913. No. 43392 A.

Valve Tests

Walschaerts Valve Gear. C. D. George. A critical discussion of recent articles describing the construction and operation. Ills. 2000 w. Ry & Loc Engng—Aug., 1913. No. 44104 C.

See also Locomotives, under *Motive Power and Equipment*.

Valve Tests

Triple Valve Tests. Explains why these tests are so necessary. 1500 w. Ry & Loc Engng—Aug., 1913. No. 44107 C.

Vestibules

A Collapsible Platform and Vestibule. Illustrates and describes an interesting innovation in construction, especially for the protection of the ends of the car body in collisions. 600 w. Ry Age Gaz—Jan. 24, 1913. No. 39399.

Wheels

The Manufacture of Chilled Iron Car Wheels. Dr. Frederick C. Weber. Information concerning a new titanium-boron ferro-alloy and an apparatus for testing car wheels. 2500 w. Met & Chem Engng—Feb., 1913. No. 39687 C.

How to Locate Defective Wheels. Extracts from a pamphlet issued by the Illinois Central R. R. on defects at the railway shop and defects on the road. Ills. 3500 w. Ry Mas Mech—April, 1913. No. 41570 C.

The Case of the Chilled Cast Iron Car

NEW PROJECTS

A., T. & S. F. Ry.

Wheel. George W. Lyndon. The manufacturers consider that the percentage of flange breaks is small considering the service conditions. 2000 w. Ir Age—May 8, 1913. No. 41905 C.

The Chilled Iron Car Wheel. A. A. Hale. Extract from a paper read before the New England R. R. Club. Reviews the history of the development, and the problems of the present time relating to the use of wheels. 3500 w. Ry & Engng Rev—Aug. 2, 1913. No. 44149.

Study of Car Wheel Flanges and Treads. L. W. Wallace. An analysis of the results of the truck tests, made for the Am. Steel Foundries, from the standpoint of the wheels. Ills. 3000 w. Ry Age Gaz (Mech Ed)—Sept., 1913. No. 44957 C.

The Future of the Chilled Car Wheel. P. H. Griffin. Discusses the possibilities of the chilled wheel in 50-ton car service, showing that chilled wheels can be made of qualities of iron and methods of manufacture as will give efficient and safe service. 5000 w. Bul Am Inst of Min Engrs—Oct., 1913. No. 46356 F.

Wheel Tests

Drop Test of Heat Treated Chrome Vanadium Wheels. Describes severe tests made, stating results. 900 w. Ry Age Gaz—Sept. 26, 1913. No. 45449.

NEW PROJECTS

Africa

The Construction of a West African Railway. G. M. Harriss. Abstract from a paper read before the Inst. of Civ. Engrs. of Ireland. Gives details of the Accra-Akwapim Ry. construction. 4500 w. Can Engr—Dec. 5, 1912. No. 38089.

The Northern Railway of Cameroon. Illustrations and brief description of a difficult task for the engineer in the German Colonies of Africa. 900 w. Sci Am Sup—Feb. 8, 1913. No. 39724.

Alaska

Report of the Alaska Railroad Commission. Information from the recently issued report of the Commission, describing the present railway facilities of Alaska, and reprinting the summary and recommendations. Map. 5500 w. Eng News—March 20, 1913. No. 40739.

Railway Routes in Alaska. Report of the Alaska Railroad Commission. Maps and Charts. 172 pp. House of Representatives—Doc. 1346. No. 42482 N.

Proposed Government Ownership in Alaska. Editorial criticism of the proposal. 2500 w. Ry Age Gaz—May 23, 1913. No. 42354.

Alaska's Need of Railway Development.

E. E. Swergal. Shows the inadequacy of the existing lines and proposed improvements to open up the natural wealth of the region. 3000 w. Ry Age Gaz—Sept. 5, 1913. No. 44982.

Algeria

The Oran State System (Le réseau Oranais de l'Etat). P. Caufourier. Description of existing railways, lines under construction, and the proposals for ultimate connections in interior Africa. Ills., maps and plate. 4200 w. Genie Civil—Sept. 6, 1913. No. 45357 D.

Alpine Railway

The Lötschberg or Bernese Alpine Railway. Dr. Alfred Gradenwitz. Brief illustrated description of a picturesque railway line connecting Lake Thun with the Simplon tunnel. 1200 w. Sci Am—May 17, 1913. No. 42098.

A New Alpine Railway. Brief illustrated description of the new Lötschberg railway in Switzerland. The electric locomotives used are the most powerful a. c. locomotives in the world. 1000 w. Sci Am Sup—May 17, 1913. No. 42201.

A., T. & S. F. Ry.

Grade Revision and Double-Tracking on the A., T. & S. F. Ry. J. G. Van

Consult Classification of the Index. See page 9.

Austria

Zandt. Maps and description of recent improvements. 2500 w. Ry & Engng Rev—Dec. 21, 1912. No. 38382.

Austria

The Mariazell Railway (Le Chemin de fer Mariazell). R. Kratochwil. General description of this 91 kilometer mountain railway in Austro-Hungary, covering construction, embankment, cut, tunnel and bridge; rolling stock, steam and electric locomotives, and cars; and overhead electric structures. Ills. 4000 w. Rev gen des Chemins de Fer—Apr., 1913. No. 41518 G.

The Mittenwald Railway (Die Mittenwaldbahn). Egon E. Seefehlner. An account of the progress in electrification between Innsbruck and Munich in the Tyrol. Maps. Serial, 1st part. 3300 w. Elek Kraft u Bahnen—Feb. 24, 1913. No. 40567 D.

Bagdad Railway

The Bagdad Railway. Harold J. Shepherson. Illustrated account of the construction of this railway now in progress. 2000 w. Sci Am—Nov. 23, 1912. No. 37734.

Boston & Maine

Boston & Maine Extension from Hinsdale, N. H., to Brattleboro, Vt. Describes the construction of a new line, seven miles long, to avoid using the tracks of the Central Vermont. Ills. 1500 w. Ry Age Gaz—Oct. 10, 1913. No. 45777.

Canada

Three Transcontinental Railways for Canada. Illustrated account of the Grand Trunk Ry., the Canadian Pacific, and the Canadian Northern systems. 3800 w. Con Rec—June 18, 1913. No. 42972.

Canadian Ry.

The Canadian Northern Ry. Henry K. Wicksteed. Maps and description of a new Canadian transcontinental railway; describes survey and exploration work through a difficult region. 4000 w. Eng News—July 10, 1913. No. 43676.

C. C. & O.

The Elkhorn Railway Extension. O. K. Morgan. Illustrated description of the characteristics of the line and the heavy construction work. 2500 w. Eng News—Oct. 16, 1913. No. 45934.

China

Rebuilt Antung-Mukden Ry., China. J. L. Dobbins. Reviews the history of the line and the work involved in its reconstruction. Ills. 4500 w. Eng News—Oct. 31, 1912. No. 37209.

The French Yunnan Railway. Illustrates and describes details of the line, and the difficulties encountered in its construction, with information as to the financial and commercial results. 3300

NEW PROJECTS

D., L. & W. R. R.

w. Engng—Jan. 3, 1913. No. 39155 A.

The Canton-Kowloon Railway. Abstracts of two papers read before the Inst. of Civ. Engrs. The first paper gives a description of the general construction and equipment, by Frank Grove and an account of the two largest bridges by Basil Tanfield Beridge Boothby. The second paper by Graves William Eves, gives statement of costs. 3000 w. Engng—Jan. 31, 1913. No. 39807 A.

The Kiangsu-Chekiang Railways. Lewis R. Freeman. Progress in China toward a modern system of railways. Ills. 2500 w. Ry Age Gaz—March 14, 1913. No. 40659.

Railway Concessions and Contracts in China. An explanation of past and present conditions affecting railway building, with a translation of the mandate of the provisional president, referring to the General Ry. Co. of the Republic of China. 2000 w. Engr, Lond—May 2, 1913. No. 42007 A.

C. M. & St. P.

Important Improvement Work on C. M. & St. P. Map and illustrated description of second track and grade revision between Aberdeen, S. D., and Montevideo, Minn. 2000 w. Ry Age Gaz—March 21, 1913. No. 40745.

Construction of the Lewistown-Great Falls Line of the C. M. & St. P. Ry. Illustrated description of the building of an important branch line. 2500 w. Ry & Engng Rev—June 28, 1913. No. 43357.

Cut-Off

A General Description of the Delaware, Lackawanna & Western Railroad Cut-off in New Jersey. Arthur L. Willgoose. Describes the work, the route, the advantages, etc. Ills. 2500 w. Cornell Civ Engr—June, 1913. No. 43186 C.

D., L. & W. Ry.

The Hopatcong-Slateford Cut-Off. C. W. Simpson. Illustrated description of this recently completed line of the D. L. & W. Ry., which embraces some of the heaviest work in this country. 3500 w. Ry Age Gaz—Dec. 6, 1912. No. 38069.

New D., L. & W. Line North of Scranton, Pa. Describes improvements being made in grade, and alinement from Clark's Summit to Hallstead. Ills. 1500 w. Ry Age Gaz—April 25, 1913. No. 41639.

The Nicholson Relocating of the Lackawanna Railroad. G. J. Ray. Explains the characteristics of new and old alinement and principal considerations for change. 1500 w. Eng Rec—April 26, 1913. No. 41539.

The Summit Cut-off of the Lacka-

Consult Classification of the Index. See page 9.

East Africa

wanna Railroad. Describes the relocation of the D. L. & W. R. R., west of Scranton, Penn.; 41 miles of new construction, including unusually heavy grading. Ills. 7000 w. Eng News—Aug. 28, 1913. No. 44884.

East Africa

The Construction of the East African Inland Railway (Vom Bau der ostafrikanischen Mittellandbahn). C. Gilman. Maps and construction notes of line from Dar-es-Salem to Tabora, in German East Africa. Ills. Serial, 1st part. 1800 w. Schweiz Bau—Sept. 20, 1913. No. 46033 D.

Egypt

Light Railway Construction in Egypt. Brief illustrated account of work in progress. 400 w. Ry Gaz, Lond—May 23, 1913. No. 42746 A.

E. P. & S. W.

Fairbanks-Tucson Extension of E. P. & S. W. Map, illustrations and description of this new line and its structures. 800 w. Ry Age Gaz—Nov. 29, 1912. No. 37945.

Erie

Double-Tracking the Erie. Brief illustrated account of extensive reconstruction work, embracing 260 miles of second and third track on lines west of Salamanca, N. Y. 1000 w. Ry & Loc Engng—May, 1913. No. 41841 C.

Grand Trunk

The Proposed Extension of the Grand Trunk Railway System in New England. Maps and explanation of the work which the Grand Trunk Co. had under way and projected. 1000 w. Eng News—Jan. 30, 1913. No. 39592.

Hamilton, Ont.

The Railway Situation in Hamilton. E. H. Darling. Gives map of the city, explaining its peculiar location and the proposed route of the Canadian Northern Ry., with changes contemplated. 2500 w. Can Engr—Sept. 4, 1913. No. 44960.

Himalayan Line

Features of the Kalka-Simla Railway. Lewis R. Freeman. An account of a 60-mile line in India in which heavy protective work was necessary, resulting in high construction cost. Ills. 1000 w. Ry Age Gaz—Oct. 10, 1913. No. 45775.

Himalayas

The Darjeeling Himalayan Railway. Lewis R. Freeman. Illustrates and describes many difficulties overcome in constructing this two-foot gage line which climbs the Himalayas on a 4% grade. 1200 w. Ry Age Gaz—Aug. 22, 1913. No. 44538.

Hudson Bay Project

Concerning the Hudson Bay Route.

NEW PROJECTS

Louisville & Nashville

William Batten McPherson. Detailed discussion of the project for opening a new outlet for Canadian products, concluding that the route is commercially feasible. Ills. 4000 w. Ap Sci—Feb., 1913. No. 40386 C.

Idaho-Northern

Construction Work on the Idaho Northern Ry. J. H. Smith. Describes features of an extension of 103 miles from Emmett north to Big Payette Lake, with terminus at McCall, Idaho. Ills. 2500 w. Eng News—July 17, 1913. No. 43835.

Ireland

An Irish Channel Railway. Henry Grattan Tyrrell. Discusses reasons why Ireland has not enjoyed equal prosperity with other parts of the United Kingdom, and considers methods of establishing a railway across the channel. 1800 w. Pop Sci M—Oct., 1913. No. 46100 C.

Italy

The Camonica Valley Railways (Le Ferrovie della Valle Camonica). O. Rainieri Tenti. Detailed description of the Iseo-Breno-Edolo and other lines in the province of Brescia, Northern Italy. Ills. and Maps. Serial, 1st part. Ing Ferro—Jan. 15, 1913. No. 40620 E.

The Belluno-Cadore Railway (Ferrovia Belluno-Cadore). A. Agostini. Details of construction of this new railway in the Venetian Alps of Northern Italy. Ills. Serial, 1st part. 2800 w. Ingeg Ferro—Mar. 31, 1913. No. 41537 D.

K. C. Southern

Kansas City Southern Railway. Map and illustrated description of this shortest line from Kansas City to the Gulf of Mexico, and the country through which it passes. 3000 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41564 N.

Long Island R. R.

Long Island Improvements at Jamaica. Illustrates and describes the elevation of tracks, including the separation of railway grades at three points, and a new station and office building. 3500 w. Ry Age Gaz—Aug. 1, 1913. No. 44115.

Louisville & Nashville

Extension Improvements on the L. & N. Illustrates and describes interesting features of the bridge, tunnel and grading work now under way between Nashville and Birmingham. 6000 w. Ry Age Gaz—July 25, 1913. No. 43923.

Extensive Improvements on the L. & N. Illustrates and describes interesting features of the bridge, tunnel and grading work now under way between Paris, Ky., and Jackson. 1800 w. Ry Age Gaz—Aug. 8, 1913. No. 44258.

Consult Classification of the Index. See page 9.

Milwaukee

PERMANENT WAY AND BUILDINGS

Accidents

New Cutoff Between Winchester and Irvine in Eastern Kentucky. Illustrated description of work on the L. & N. Ry., including heavy grading and high viaducts. 3500 w. Eng Rec—Sept. 6, 1913. No. 44997.

Continuation of Louisville and Nashville Improvements in Eastern Kentucky. Illustrates and describes features of reconstruction and new construction. 1800 w. Eng Rec—Sept. 27, 1913. No. 45480.

Milwaukee

The St. Paul Improvements at Milwaukee. Describes a new terminal and hump yard costing \$750,000 which will relieve congestion. 2000 w. Ry Age Gaz—July 4, 1913. No. 43478.

Mittenwald

The Mittenwald Railway. Brief illustrated description of a 15,000-volt, single-phase railway with a 50,000-volt transmission system from hydroelectric stations in the Austro-Bavarian Tyrol mountain region. 1200 w. Elec Ry Jour—July 5, 1913. No. 43465.

New York Central

New York Central Improvement at Rome. Emile Low. Describes changes made necessary by construction of the Barge Canal, involving street and stream crossings and a new station. Ills. 1500 w. Ry Age Gaz—Aug. 15, 1913. No. 44404.

Norfolk Southern

New Extension of the Norfolk Southern. Map and illustrated description of the consolidation of three short roads west of Raleigh, N. C., and the construction of a new line to Charlotte. 2500 w. Ry Age Gaz—June 13, 1913. No. 42816.

Pennsylvania R. R.

Six-Tracking a Heavy-Traffic Line and Elevating for Grade-Crossing Elimination. Illustrates and describes improvements on the Pennsylvania R. R. at Rahway, N. J. 3500 w. Eng Rec—Dec. 28, 1912. No. 38577.

Southern Railroads

Immediate Task of Railroad Systems of the South. Samuel G. Wilmer. Reviews possibilities of development and work needed before the opening of the Panama Canal, describing recent improvements. 4500 w. Mfrs' Rec—March 27, 1913. (Special.) No. 41555 N.

Switzerland

The Ebnat-Nesslau Railway (Die Bahnlinie Ebnat-Nesslau). A. Acatos. An outline of the topographical conditions, bridges and embankments on this new road. Ills. and maps. Serial, 1st part. 2000 w. Schweiz Bau—Feb. 1, 1913. No. 40528 D.

The Railway of the Bernese Alps (Le Chemin de Fer des Alpes Bernoises). Ch. Dantin. Illustrated description of the newly completed Berne-Loetschberg-Simplon railway. Plate. 6400 w. Genie Civil—July 5, 1913. No. 43578 D.

Notes on European Electric Railways. Louis Bell. Impressions gained during a recent trip over the New Lötschberg Ry. in Switzerland and the older Lecco-Colico line in northern Italy. Ills. 2000 w. Elec Ry Jour—Sept. 6, 1913. No. 45002.

The Bernese Alps Railway and the Lötschberg Tunnel (Le Chemin de fer des Alpes bernoises et le Tunnel du Lötschberg). J. Moret. General description of the line and details of the tunnel construction. Ills. 3600 w. Tech Mod—Aug. 1, 1913. No. 45334 D.

See also Tunnels, under *Permanent Way and Buildings*.

Trono Railway

The Trono Railway. Raymond Ashton. Interesting account of a short desert railway to be constructed in California, to reach the vast potash and borax deposits at Searles lake. Ills. 1800 w. W Engng—Aug., 1913. No. 44387 C.

Tunnel Railway

A Parcels Post Tunnel Railway. Illustrated description of a system constructed for demonstration purposes. 1500 w. Sci Am—Jan. 4, 1913. No. 38775.

West Africa

The Railway Systems of West Africa. H. O. Mance. Considers the objects of railway construction, the location, the French railways, German, and existing railways, the scheme of development, etc. Discussion. Maps. 11000 w. Jour Roy U S Inst—Feb., 1913. No. 40392 N.

West Virginia

Construction of the Buckhannon & Northern Railroad. R. E. Kerr. Illustrated account of this line in northern West Virginia, built especially to develop coal lands. 1800 w. Ry Age Gaz—Oct. 3, 1913. No. 45663.

PERMANENT WAYS AND BUILDINGS

Accidents

Accidents in Shops and Engine Houses. George Bradshaw. Address before the

Co-operative Safety Congress at Milwaukee. Discusses causes of injuries. 3000 w. Am Engr—Nov., 1912. No. 37307 C.

Consult Classification of the Index. See page 9.

Avalanche Construction PERMANENT WAY AND BUILDINGS**Curves****Avalanche Construction**

Avalanche Construction on the Bernese Alps Railway at Bern, Lötschberg and Simplon (Die Lawinenverbauungen der Berner Alpenbahn Bern-Lötschberg-Simplon). K. Imhoff. Describes the extremely heavy constructions required on this road, together with the great precautions taken to prevent slides. Ills. and maps. Serial. 1st part. 3200 w. Zeit des Oest Ing u Arch Vereines—Dec. 20, 1912. No. 39049 D.

Ballast

Keeping Stone Ballast Clean. C. E. Lindsay. Considers the necessity of protecting it from dirt and cinders, and an effective method of screening ballast on renewal. 1800 w. Ry Age Gaz—Dec. 20, 1912. No. 38348.

Report of Committee II.—On Ballast. Report on proper depth, physical tests of stone for ballast, methods of grading, cleaning stone ballast, etc. Ills. 6000 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40403 N.

Buffer

Test of a Hydraulic Buffer. Carl Schwartz. Describes the methods used to determine the performance of an experimental hydraulic buffer for railroad terminal stations and the results. Ills. 1200 w. Jour Am Soc of Mech Engrs—June, 1913. No. 42952 D.

Buildings

Report of Committee VI.—On Buildings. Gives report on roofing, and report on freight house floor construction. Ills. 17500 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40404 N.

Cable Railways

Mont. Blanc Mountain-Railway (Les chemins de fer du massif du Mont-Blanc). P. Dalimier. Construction details in proposed aerial cable to l'Aiguille du Midi. Ills. and plates. 6800 w. Génie Civil—Nov. 23, 1912. No. 38490 D.

Car-Bumpers

Automatic Car-Bumpers and Barriers for Drawbridge Approaches. Illustrates and describes two devices invented by J. B. Strauss. 1200 w. Eng News—Nov. 14, 1912. No. 37591.

Chicago

Proposed Development of Chicago Railway Facilities. Recommendations by John F. Wallace for two new passenger terminals, one for the south side and one for the west side. 4500 w. Ry Age Gaz—Oct. 24, 1913. No. 46196.

Classification Yards

New Coal Classification Yards of the Philadelphia & Reading Ry. at St. Clair, Penn. Joseph S. Ward. Illustrated detailed description of the yard, bridges,

drainage, water supply, buildings and structures. 7500 w. Eng News—Sept. 18, 1913. No. 45220.

Coaling Stations

Notes on the Design and Operation Costs of Modern Locomotive Coaling Stations. Notes based on a report of a committee of the Int. Ry. Fuel Assn. Deals with the types of stations, materials and cost. 2500 w. Engng & Con—July 23, 1913. No. 43874.

Concrete

Concrete Practice—National Railways of Mexico. A. M. Wolf. Illustrated description of a plain concrete pier and abutment, and a reinforced concrete abutment. 1500 w. Ry Engng & Main of Way—July, 1913. No. 43770.

Concrete Buildings

Concrete Buildings on the Lackawanna. Illustrated descriptions of passenger stations and signal towers of attractive design. 1000 w. Ry Age Gaz—Sept. 19, 1913. No. 45261.

Recent Applications of Concrete on the Long Island R. R. From a paper by Frederick Auryansen, read at the Nat. Assn. of Cement Users. States advantages and illustrates and describes recent work. 4500 w. Ry & Engng Rev—Aug. 30, 1913. No. 44877.

Construction

Methods and Cost of Constructing the Bear Creek Branch of the Cincinnati, New Orleans and Texas Pacific Railway. David W. Stradling. Explains methods used to reduce the cost of construction on some work where economy was important. 4000 w. Engng & Con—Feb. 5, 1913. No. 39702.

Construction Work on a Short Railroad Branch. Describes work on a branch of the Central R. R. of New Jersey, building bridge piers in shallow water, cofferdams, erecting long girders with derrick car, and making fill with movable trestle. Ills. 2500 w. Eng Rec—June 14, 1913. No. 42828.

Construction Organization

The Burlington's Construction Organization. An account of the duties of the superintendent of construction equipment and explanation of the system used. 1700 w. Ry Age Gaz—July 18, 1913. No. 43801.

Curves

Application of Geometric Anamorphosis to Parabolic Transition Curves. Manuel G. de C. Rueda. Describes the method adopted. 850 w. Bul Int Ry Cong—March, 1913. No. 40914 G.

Formulas for Radial Distances Between Curves. George Paaswell. Mathematical. 900 w. Eng News—March 20, 1913. No. 40741.

Consult Classification of the Index. See page 9.

Deterioration

PERMANENT WAY AND BUILDINGS

Grade Crossings

The Plotting of Railway Curves. J. L. Busfield. Explains a method used with success in Great Britain. 1500 w. Can Engr—June 19, 1913. No. 42993.

A Special Problem in Reverse Curves. William C. Crosby. Presents the problem and its solution. 1200 w. Eng News—June 26, 1913. No. 43314.

See Surveying, under CIVIL ENGINEERING, Measurement.

Deterioration

Observations Noted Since 1908 as to the Various Causes of Wear and of Deterioration of Roadways. Abstracts of the reports presented at the Third Int. Road Cong. at London. Deals with roadways in town, and suburban districts, and in suburban districts and open country. 6500 w. Engng & Con—July 16, 1913. No. 43819.

Drainage

Drainage of Railway Roadbed. J. T. Bowser. Considers methods of disposal of surface and subsurface water. 3000 w. Eng Rec—March 15, 1913. No. 40644.

Railway Drainage. Deals with the collection and disposal of surface water separate from the sewage drainage. Ills. 3000 w. Engr, Lond—April 18, 1913. Serial. 1st part. No. 41773 A.

Earthwork

Methods of Handling Light Earthwork. H. C. Landen. An account of experience gained in moving 330,000 cu. yds. on 14 miles of line in North Carolina, with details of force employed and cost of work. Ills. 2000 w. Ry Age Gaz—Aug. 15, 1913. No. 44405.

Embankments

The Work of Strengthening and Drainage Along the Railway Between Digne and Nice (Note sur les Travaux de Consolidation et d'Assainissement Exécutés sur le Chemin de fer de Digne à Nice). M. Perrissond. Details of retaining walls of concrete constructed to reinforce existing masonry walls. Ills. 6000 w. Ann de Ponts et Chaussées—Sept.-Oct., 1912. No. 37489 E + F.

Extra Top Width for New Fills. J. C. L. Fish. Gives a method of determining the extra top width to be given a new fill. Discussion. 3000 w. Bul Am Ry Engng Assn—Aug., 1913. No. 45415 N.

Permanent Way at Million Dollars a Mile. An account of a three-mile fill on the Can. Northern Ry. across Rainy Lake. 2000 w. Con Rec—Sept. 10, 1913. No. 45067.

Feeders

Radical Departure Proposed in Railway Branch Line Service. Francis E. Drake. On the advantages of the pas-

senger tractor (Dracar) for such service. 1500 w. Ry & Engng Rev—June 7, 1913. No. 42707.

Flood Damage

Railway Damage and Railway Reconstruction in the Ohio Flood Districts. Reports concerning damages on the B. & O. system, the Big Four, and the Toledo & Ohio Central and Zanesville and Western Railways. Ills. 3500 w. Eng News—April 24, 1913. No. 41624.

Damage by Floods to Railroads. Illustrated account of more of the damages caused by the recent floods. 2000 w. Ry Age Gaz—April 4, 1913. No. 41073.

Floods

Flood Destruction on the San Pedro Railway. H. G. Tyrrell. Illustrated account of the floods of 1905 and 1907, and the flood of 1910 which interrupted traffic for more than four months. 2200 w. Eng News—July 3, 1913. No. 43435.

Baltimore and Ohio Flood Reconstruction. Illustrated description of the general conditions existing during the reopening of the lines with detailed data. 3000 w. Ry Age Gaz—July 18, 1913. No. 43800.

Freight Houses

Freight House Design and Operation. W. G. Arn. Discusses the design of the freight houses, layout of track facilities and methods of work. 4000 w. Eng News—Oct. 31, 1912. No. 37206.

Freight Terminals

New York's Freight Terminal Problem. Map and explanation of the peculiar difficulties encountered and some of the solutions offered. 3000 w. Ry Age Gaz—April 11, 1913. No. 41176.

A New Railway Freight Terminal at St. Louis. Illustrates and describes recent reconstruction work at St. Louis, Mo. 2000 w. Eng News—April 3 1913. No. 41066.

Southern Railway Freight Station and Office Building at Atlanta, Ga. Brief illustrated description. 1200 w. Ry Age Gaz—April 11, 1913. No. 41174.

Gauges

Unification of Railway Gauges in Australia. Reviews a recent report, explaining conditions and the cost of unification, the difficulties, etc. 2500 w. Engr, Lond—June 27, 1913. No. 43646 A.

Grade Crossings

I. Railway Grade Crossing Elimination Viewed From the City's Standpoint. Robert Hoffmann. II. Elimination of Grade Crossings. Albert J. Himes. III. Grade Elimination and Railroad Bridges. G. H. Tinker. IV. Embellishment of Railroad Crossings. Frederic Wm. Striebing. Short articles discussing phases

Grade Crossings

PERMANENT WAY AND BUILDINGS

Location

of this subject. Ills. 5500 w. Jour Cleveland Engng Soc—Nov., 1912. No. 37544 D.

Grand Trunk Grade Separation in Toronto. Highway grade crossings are being eliminated and plans made for new terminals including a union passenger station. Ills. 4000 w. Ry Age Gaz—June 6, 1913. No. 42677.

Three Level Crossing at 15th Street, Chicago. Illustrated description of a difficult project to eliminate street and railway grade crossings. 3000 w. Ry Engng & Main of Way—June, 1913. No. 42975.

Grade Crossing Elimination at Second Avenue and Try Street, Pittsburgh. Illustrates and describes improvements embodying several types of masonry and bridge-floor design. 2000 w. Eng Rec—July 12, 1913. No. 43652.

Grade Crossings and Automobiles. Editorial discussion of the question of safety at grade crossings and what should be done to meet the changed conditions. 2000 w. Ry Age Gaz—Aug. 29, 1913. No. 44804.

The Elevation of the Tracks of the Philadelphia, Germantown and Norristown Railroad, Philadelphia, Pa. Continued discussion of the paper by George S. Webster and Samuel Tobias Wagner. 3000 w. Pro Am Soc of Civ Engrs—Sept., 1913. No. 45525 F.

Grade Reduction

Grade Reduction Problems. C. P. Howard. A study of grades on a 130-mile division. 7500 w. Bul Am Ry Engng Assn—Aug., 1913. No. 45413 N.

Factors Entering Into Grade Reductions. Analysis of the estimated saving in a proposed change from a 0.6 to a 0.3 per cent ruling grade on a typical 130-mile division. 2200 w. Eng Rec—Oct. 4, 1913. No. 45672.

Grade Reduction and Doubletracking on the Nashville, Chattanooga & St. Louis Ry. A description of improvements made necessary by heavy traffic. 2500 w. Eng News—Oct. 23, 1913. No. 46157.

Grades

Some Features of Grade Separation by Joint Track Elevation in Joliet, Ill. R. A. Cook. From a paper before the Illinois Soc. of Engrs. & Survs. Describes features of the engineering work. 2500 w. Engng & Con—Feb. 5, 1913. No. 39703.

Economical Limits of Grade Reduction. Walter Loring Webb. Discussion of the factors entering into an analysis of train resistances and their respective importance. 3000 w. Ry Age Gaz—March 28, 1913. No. 40943.

The Minimum Efficient Gradient. Paul M. La Bach. Considers the problem one

of virtual grades and speed curves so surrounded by operating conditions that it is unsafe to draw conclusions from similarities based on grade lines alone. 1500 w. Ry Age Gaz—July 11, 1913. No. 43663.

Grading

Heavy Grading in Treacherous Material. Illustrates and describes the construction of a railroad roadbed through material that slips badly when wet. 1500 w. Eng Rec—Nov. 16, 1912. No. 37581.

Grand Central Terminal

Opening of the New Grand Central Terminal, New York City. Illustrated account of this station with 33 miles of depressed tracks designed to handle 250,000 passengers per day and built under trying traffic conditions. Also editorial. 6000 w. Eng Rec—Feb. 8, 1913. No. 39726.

The Grand Central Terminal, New York. Illustrates and describes details. 2500 w. Ry Age Gaz—Feb. 14, 1913. No. 39851.

See also Columns, and Roofs, under CIVIL ENGINEERING, Construction, and Terminals, under Permanent Way and Buildings.

Guard Rails

Guard Rail Design. F. W. Rizer. Explains the function of the guard rail, discussing its designs. Ills. 1100 w. Ry Age Gaz—May 16, 1913. No. 42214.

See also Tracks, under STREET AND ELECTRIC RAILWAYS.

Improvements

The Relaying and Improvement of the Berks & Hants Junction, Reading, Great Western Railway. Describes remodeling of rail crossings on improved principles. Ills. 1400 w. Ry Gaz, Lond—Jan. 17, 1913. No. 39465 A.

Inspection

Permanent-Way Inspection by the Paired-Inspector System. Erwin Hohenegger. Explains the system and its application. 1000 w. Bul Int Ry Cong—Aug., 1913. No. 44705 G.

Junctions

Fly-Over Junction on Metropolitan District Railway at Earl's Court. Illustrates and describes interesting work near Earl's Court Station to provide means for getting trains through the station. 1200 w. Engng—May 2, 1913. No. 42005 A.

Labor

The Hindoo as a Track Laborer. The seventh and last of a series of discussions of the characteristics of the various types of maintenance workmen. 1000 w. Ry Age Gaz—Dec. 20, 1912. No. 38349.

Location

The Tacheometer in Railway Location. E. R. Lewis. Shows that better results

Consult Classification of the Index. See page 9.

Maintenance

PERMANENT WAY AND BUILDINGS

Rails

are possible than by present methods. Ills. 1800 w. Ry Age Gaz—Nov. 8, 1912. No. 37331.

Report of Committee XVI—On Economics of Railway Location. Gives an analysis of maintenance of way and structural accounts, showing the influence of changes in physical characteristics of locations. 15500 w. Bul Am Ry Engng Assn—Jan, 1913. No. 40221 F.

Maintenance

Economy in Use of Materials in Railway Maintenance of Way Departments. A. Swartz. Calls attention to small losses and waste that amount to great expense in the course of the year. 2200 w. Engng & Con—March 19, 1913. No. 40736.

Winter Maintenance Methods Contest. Gives nine papers by different writers, discussing means of meeting problems. 6000 w. Ry Age Gaz—March 14, 1913. No. 40660.

Mono-Railway

The Listowel & Ballybunion Railway. J. B. Williams. Illustrated description of a mono-railway constructed on the Lartigue system in Algeria. 700 w. Ry & Loc Engng—April, 1913. No. 41028 C.

Rack Railways

Mountain Railways About Mt. Blanc (Les Chemins de fer du massif du Mont-Blanc). P. Dalimier. Reviews present and proposed rack railways of adjacent lines and equipment. Ills. Serial. 1st part. 7500 w. Génie Civil—Oct. 19, 1912. No. 37516 D.

Vitznau-Rigi Railway. Hugh G. Bontell. Illustrated description of the first rack railway in Switzerland and its equipment. 700 w. Ry & Loc Engng—April, 1913. No. 41027 C.

Rack Railways (Le ferrovie a dentiera). Alfonso Maffezzoli. A mathematical study of the power requirements under varying conditions exemplified by a thorough study of several railways. Diagrams. Serial. 1st part. 4000 w. Angeg Ferro—Apr. 30, 1913. No. 42506 D.

Rail Anchors

Rail Anchors or Anti-Creepers. Illustrates and describes two devices holding the rail by a wedging action. 1200 w. Eng News. Dec. 5, 1912. No. 38061.

Rail Bonding

Notes on Rail Bonding. Vincent Rhea. Discusses the comparative costs in power expended with two types of rail bonds and compares results upon the basis of a one-mile track of 40-lb. rails per year. 1200 w. Coal Ave—Sept. 27, 1913. No. 45483.

Rail Corrosion

See Corrosion, under ELECTRICAL ENGINEERING, *Electro-Chemistry*.

Rail Failures

Rail Failures and Their Causes. M. H. Wickhorst. Read before the Am. Soc. for Test. Mat. Considers present available information concerning the nature of the failures and their causes. Ills. 3000 w. Eng News—July 3, 1913. No. 43436.

Rail Failure Statistics for the Year Ending October 31, 1912. Report of the committee on rail, with discussion. 221 pp. Bul Am Ry Engng Assn—July, 1913. No. 45164 N.

Failure of an Open-Hearth Steel Rail. Information from James E. Howard's report to the Interstate Commerce Commission. Declares failure not due to defects in the rail, but caused by overloading. 2500 w. Ir Age—Sept. 11, 1913. No. 45053 C.

Rail Inspection

Recent Developments in the Inspection of Steel Rails. Robert W. Hunt. Outlines the situation as it was in the early part of 1912, with information concerning present practice and the forms used. 2000 w. Bul Am Inst of Min Engrs—Dec., 1912. No. 38371 F.

Rail Joints

New Type of Rail Joint for Bascule and Vertical-Lift Bridges. Illustrated description of the rail joint and locking device which has been in successful operation for the past year on the Calumet River bridge near S. Chicago. 1500 w. Ry & Engng Rev—May 10, 1913. No. 41976.

Cast-Weld Joints and Steel Ties in Brooklyn. Illustrates and describes the latest cast-weld joint practice for curves and tangents on some experimental steel tie construction. 3000 w. Elec Ry Jour—Oct. 25, 1913. No. 46212.

Rails

Reports of Committee on Rail. Reports ductility and elongation tests, abrasion tests of rail on revolving machine, influence of titanium and pipeless ingots in rail manufacture, ductility, etc., giving rail failure statistics. Ills. 411 pp. Bul Am Ry Engng Assn—July, 1912. No. 37681 E.

Inspection of Steel Rails. Robert Job. An account of the system in use by the Reading and the Lehigh Valley, discussing methods proposed and tried in the effort to safeguard the quality of rails. 2500 w. Ry Age Gaz—Nov. 1, 1912. No. 37249.

Titanium Rails. Explains how titanium should be used in order to have it accomplish the intended work and gives a report of service tests. 1700 w. Ry Age Gaz—Dec. 13, 1912. No. 38187.

Consult Classification of the Index. See page 9.

Rails

PERMANENT WAY AND BUILDINGS

Standardization

Investigation of Silvery Oval Spots, Sometimes Called "Transverse or Internal Fissures," in Rail Heads. W. C. Cushing. Reports an investigation of this type of rail failure. Ills. 2500 w. Bul Am Ry Engng Assn—Nov., 1912. No. 39559 N.

Report of Committee IV on Rail. The work for the year included a revision of the manual, recommendations on standard rail sections, investigation of rail failures, special investigation of rails, etc. 7500 w. Bul Am Ry Engng Assn—Nov., 1912. No. 39558 N.

Rail Research by Railroads and Producers. M. H. Wickhorst. Brief report of the results obtained by the joint efforts of steel rail users and manufacturers. 2500 w. Ir Trd Rev—Feb. 13, 1913. No. 39845.

Rail Creeping. J. G. Van Zank. Considers this trouble, its causes; results, appliances known as "anti-creepers," tests, prevention, etc. Ills. 3000 w. Ry Engng & Main of Way—March, 1913. No. 40789.

Classification of Second Hand Rail. Jay See. Outlines method used for grading and handling. Ills. 2500 w. Ry Age Gaz—April 18, 1913. No. 41351.

Comparative Notes on Steel Rail Rolling. Robert W. Hunt. Notes showing the importance of mechanical and heat treatment of metal. 1200 w. Bul Am Inst of Min Engrs—May, 1913. No. 42462 F.

Creeping of Rails. Paul M. La Bach. Briefly considers the principal causes of creeping. 1500 w. Ry Age Gaz—May 16, 1913. No. 42212.

Safety in Travel as Affected by the Steel Rail. Illustrated condensed sketch of the present methods of rail manufacture, pointing out the lines along which improvement is being sought. 3000 w. Sci Am—June 7, 1913. No. 42667.

Steel Rail Failures and Some of Their Causes. M. H. Wickhorst. Read before the Am. Soc. for Test. Mat. Classifies various rail failures and considers their causes. Ills. 3000 w. Ir Trd Rev—June 26, 1913. No. 43237.

Shape, Material and Resistance of Rails. A. Flamache. Discusses systems of track suitable for main railroads, and the strength of the rails, their weight, etc. 7600 w. Bul Int Ry Cong—July, 1913. No. 43979 G.

Nomographic Method for Finding Center of Gravity and Moment of Inertia. Describes a new method which consists in drawing a "curve of moments" and a "curve of inertia" for the rail section under consideration and measuring their respective areas by the planimeter. 1000

w. Ry Age Gaz—Aug. 29, 1913. No. 44810.

Specifications for Manganese Steel Rails. Gives the specifications of the Manganese Steel Rail Co., New York. 1000 w. Ry Age Gaz—Aug. 15, 1913. No. 44407.

Rail Tests

The Testing of Rails. R. Scheibe. Reviews a theoretical article about the quality co-efficient of the metal used for the track and rolling stock of railways, giving a summary of the article by Dr. H. Saller. 2200 w. Bul Am Ry Engng Assn—Nov., 1912. No. 39563 N.

Report Systems

Daily Time and Material Report Systems. Explains methods being tried by the maintenance departments of several roads to secure better reports. 1500 w. Ry Age Gaz—Sept. 19, 1913. No. 45260.

Right of Way

Right of Way Multiples in California. Walter Melvin Wells. First of three articles discussing the general questions involved and giving a tabulation of the results determined. Also editorial. 8000 w. Engng & Con—Aug. 13, 1913. Serial, 1st part. No. 44343.

Roadway

Report of Committee I—On Roadway. Mainly a report on tunnel construction and ventilation. 13000 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40407 N.

Roundhouses

New Locomotive Terminal at Mohon (Nouveau dépôt de locomotives de Mohon). M. M. Henry and Valat. Describes new building for the Compagnie de l'Est. Ills. 4600 w. Rev Gen d Chemins de Fer—Dec., 1912. No. 38486 G.

Superior European Roundhouse Facilities. Henry W. Jacobs. Describes facilities on the Hungarian State Rys. and in France. Ills. 2500 w. Am Engr—April, 1913. No. 41090 C.

Sheds

See Reinforced Concrete, under CIVIL ENGINEERING, Construction.

Shops

Transcona Shops of the National Transcontinental Railway. George S. Hodgins. Illustrates and describes construction and equipment features. 2500 w. Mach (Ry Ed)—Dec., 1912. No. 38106 C.

Shop Improvements at Burnside, Ill. Illustrates what may be done to improve power conditions at old shops. Ills. 1500 w. Am Engr—April, 1913. No. 41091 C.

Standardization

Standardization on Continental Railways. Discusses the items already

Consult Classification of the Index. See page 9.

Stations

PERMANENT WAY AND BUILDINGS

Terminals

agreed upon. 1400 w. Ry Gaz, Lond—Nov. 15, 1912. Serial. 1st part. No. 37811 A.

The Efforts to Standardize American Railways. Mr. Wernecke. States the early conditions which resulted in a chaotic aggregate, and the progress made toward uniformity. 3800 w. Bul Int Ry Cong—June, 1913. No. 43173 G.

Stations

Supplying the Berlin Railway Station With Gas (Die Versorgung der Berliner Bahnhöfe mit Oelgas). Description of the work caused by laying pipes through the streets, over bridges, etc. Ills. Serial. 1st part. 4000 w. Glaser's Ann—Oct. 1, 1912. No. 37418 D.

Underground Features of the Paris-Nord Station for Baggage (Souterrain de la Gare de Paris-Nord pour le Transport des Bagages). M. M. Sabourin and Théry. Describes arrangement of tracks and station for passenger and baggage service. Ills. 2700 w. Rev Gén des Chemins de Fer—Sept., 1912. No. 37491 G.

The New Snow Hill Station, Birmingham, Great Western Railway. Illustrations and description of an extensive station recently completed. 1200 w. Ry Gaz, Lond—Jan. 24, 1913. No. 39783 A.

Attractive Stations for Small Towns. Illustrates and describes new passenger facilities on the Buffalo, Rochester and Pittsburgh. 600 w. Ry Age Gaz—Feb. 28, 1913. No. 40241.

The New Station at Leipzig (La nouvelle gare centrale de Leipzig). A. B. des Chaumes. Details of construction and illustrations of finished structure. Plates. 3000 w. Genie Civil—Feb. 15, 1913. No. 40592 D.

New Passenger Station for the D., L. & W. R. R. at Montclair, N. J. Illustrations and descriptive details of a beautiful station. 1200 w. Ry & Engng Rev—July 12, 1913. No. 43691.

The Architecture of Railway Stations. M. S. Briggs. A review of the development of railway stations in England. 3000 w. Archt, Lond—Aug. 8, 1913. Serial, 1st part. No. 44443 A.

Reconstruction of the G. W. R. Snow-Hill Station, Birmingham. F. Gleadow and C. E. Shackle. Illustrated detailed description of the reconstructed station. Plate. 4500 w. Engr, Lond—Sept. 12, 1913. No. 45407 A.

The New Central Station at Copenhagen (La nouvelle gare centrale de Copenhague). Brief description of location and general appearance of the new railway depot. Ills. and Plate. 1100 w. Genie Civil—Aug. 23, 1913. No. 45353 D.

Structures

Bridges, Viaducts and Embankment Work of the New York Connecting Railroad. Illustrates and describes structures. The principal one is the 4-track 1000-ft. steel arch span across Hell Gate. 2000 w. Eng Rec—July 19, 1913. No. 43791.

Subway Construction

Unit System of Subway Construction. A. R. Eitzen. Illustrates and describes construction work of the Kansas City Terminal. 800 w. Ry Age Gaz—Dec. 13, 1912. No. 38183.

Switches

Railway Switches and Track Layouts. J. L. Busfield. A general description of the construction of switches and their assembling in groups to give yard layouts, and related problems. Ills. 2500 w. Can Engr—April 3, 1913. No. 41098.

A New Automatic Railway Switch. Illustrated description of the Goodrich automatic switch and its action. 2000 w. Engng & Con—Aug. 20, 1913. No. 44496.

Improved Slip-Switch Crossings: Pennsylvania R. R. Illustrates and describes a new design of double slip-switch crossing for movements between tracks. 2000 w. Eng News—Aug. 7, 1913. No. 44250.

Terminals

New Terminal Plan for Chicago by Mr. Jarvis Hunt. Plans and description of a proposed rearrangement of railroad terminal facilities as a means of remedying the unsatisfactory situation. Ills. 2000 w. Ry & Engng Rev—Nov. 23, 1912. No. 37798.

Rail and Water Terminal Construction at Texas City. Harvey A. Thomas. Illustrates and describes warehouse, grain elevator, conveyor systems, etc. 2500 w. Ry & Engng Rev—Nov. 16, 1912. No. 37660.

The Kansas City Freight and Passenger Terminal. A. D. Ludlaw. Gives the general layout of work and a detailed description of unit subway construction. Ills. 2000 w. Concrete-Cement Age—Nov., 1912. No. 37586.

Watervliet Terminal, Delaware & Hudson Co. J. C. Chapple. Illustrated description of an extensive modern plant five miles from Albany. 4500 w. Ry Engng & Main of Way—Dec., 1912. No. 38338.

Railway Terminals. L. C. Fritch. From an address before the Can. Ry. Club. Gives details of cost of the immense passenger terminals and their maintenance, and especially discusses

Consult Classification of the Index. See page 9.

Terminals

PERMANENT WAY AND BUILDINGS

Terminals

conditions at Chicago. 2200 w. Ry Age Gaz—Jan. 17, 1913. No. 39204.

Latest Passenger Terminal Train Shed. Summary of advantages and disadvantages of various types of train shed and illustrated description of continuous low-roof sheds at Jersey City and Ottawa. 3000 w. Eng Rec—Jan. 4, 1913. No. 38800.

Jamaica Improvement of the Long Island Railroad. Illustrates and describes new yard and station facilities at junction of steam lines with electric branches leading into New York City. 2000 w. Eng Rec—Jan. 11, 1913. No. 38958.

New "Cotton Belt" Freight Terminal at St. Louis. Winters Haydock. Illustrated description of a new terminal occupying three city blocks. 1500 w. Ry & Engng Rev—Jan. 25, 1913. No. 39423.

Terminal Service. W. M. Prall. A discussion of terminal problems, car movements, organization, etc. General discussion. 8500 w. Pro Ry Club of Pittsburgh—Jan. 24, 1913. No. 39943 C.

Centralia Terminal, Illinois Central R. R. Illustrated detailed description of a recently completed up-to-date terminal. 3000 w. Ry Mas Mech—Feb., 1913. No. 39923 C.

Railway Terminals. L. C. Fritch. Read before the Can. Ry. Club. Discusses the subject generally and the Chicago problem in particular. 4000 w. Ry & Engng Rev—March 15, 1913. No. 40692.

Railway Terminals in Large Cities and the Latest Chicago Terminal Project. Editorial discussion of this problem, especially the various projects suggested for Chicago. 2500 w. Eng News—Feb. 27, 1913. No. 40240.

Grand Trunk Terminal at Ottawa, Ont. Illustrated description of the new union passenger station and Chateau Laurier. 3000 w. Ry Age Gaz—March 7, 1913. No. 40358.

Construction Work of the Kansas City Terminal Ry. Illustrated description of new work in progress which will give Kansas City the second largest railway station in the United States. The improvements are estimated to cost about 30,000,000 dollars. 3500 w. Ry & Engng Rev—March 16, 1913. No. 40691.

Centralia Terminal, I. C. R. R. Illustrated detailed description of a recently completed up-to-date terminal at Centralia, Ill. 2500 w. Ry Eng & Main of Way—March, 1913. No. 40790.

New Kansas City, Mo., Passenger Terminal. Plan, map, and illustrated description of a project including belt line and complete facilities. The union station for all roads is nearly completed.

2500 w. Ry Age Gaz—May 23, 1913. No. 42355.

Progress on the Grand Central Terminal. Illustrated description of the project and of details of construction. 2800 w. Ry Age Gaz—Nov. 22, 1912. No. 37760.

Monumental Gateway to a Great City. Illustrated account of the completing of the Grand Central terminal in New York. 4000 w. Sci Am—Dec. 7, 1912. No. 38071.

New Terminal for New York Central Lines. Illustrated description of this terminal and its electrical features. 5000 w. Elec Wld—Dec. 21, 1912. No. 38356.

A History of the Grand Central Terminals in New York. Illustrates and describes the various stations since 1832. 3000 w. Archt & Bldg—April, 1913. No. 42320 C.

The Grand Central Terminal Station. Theodore Starrett. A brief semi-serious criticism. Ills. 1200 w. Archt & Bldg—April, 1913. No. 42319 C.

The New Grand Central Terminal Station in New York City; An Underground Double-Deck Terminal. Illustrated detailed account of the reconstruction of this terminal. 7500 w. Eng News—May 1, 1913. No. 41861.

The New Central Terminal Station in New York (La nouvelle gare centrale terminus de New-York). P. Calfas. An illustrated description of the new Grand Central Terminal. 4500 w. Genie Civil May 10, 1913. No. 42196 D.

The Grand Central Railway Station, New York. Brief illustrated description of the design of the new terminal and the preliminary work. Plates. 5000 w. Engng—May 30, 1913. No. 42781 A.

A New Port and Railroad Terminal on the Gulf—Freeport, Tex. A. W. Davis. Illustrated account of this harbor and terminal, the recent improvements and advantages. 3000 w. Ry & Engng Rev—May 31, 1913. No. 42577.

Illinois Central Mechanical Terminal. Illustrated description of the construction of a terminal at Centralia, Ill., which was carefully designed and well equipped. 5000 w. Ry Age Gaz—June 27, 1913. No. 43243.

Mechanical Terminal for Illinois Central. Willard Doud. Illustrated description of the car and locomotive repair plants at Centralia, Ill. 4500 w. Ry Age Gaz (Mech Ed)—July, 1913. No. 43422 C.

Locomotive Terminals and Repair Facilities of the Northern Pacific Ry. in the State of Washington. Illustrated detailed description of the facilities at Centralia,

Terminals

PERMANENT WAY AND BUILDINGS

Ties

Pasco, and Parkwater. 2500 w. Ry & Engng Rev—June 7, 1913. No. 42706.

Relocating of Chicago Railway Terminals. Plan and description of the principal features with some of the reasons for rebuilding. 4500 w. Ry Age Gaz—May 30, 1913. No. 42638.

Terminal Passenger Stations. Their Design and Operation. J. L. Busfield. The present article considers the selection of a site, size, design, etc., describing types. Ills. 2500 w. Can Engr—May 29, 1913. Serial. 1st part. No. 42628.

Proposed Plan of One Central Railway Terminal for Chicago. R. C. Sattley. Gives plan for a central freight and passenger terminal with description. 5500 w. Ry & Engng Rev—July 12, 1913. No. 43692.

The Montreal Tunnel and Terminal. S. P. Brown. Map and illustrated description of remarkable railway construction on the Canadian North Ry. to furnish terminal facilities at Montreal. 4500 w. Eng News—July 10, 1913. No. 43675.

A Large City Freight Terminal. Illustrated description of the new freight terminal for the "Soo Line" at Chicago. 4500 w. Eng News—Aug. 21, 1913. No. 44577.

New "Soo" Freight Terminal at Chicago. Arthur R. Lord. Gives details of the design and construction of a large elevated freight terminal carried on a reinforced concrete structure. Ills. 2000 w. Ry Age Gaz—Aug. 22, 1913. No. 44537.

Soo Line Freight Terminal in Chicago. Describes the construction of 18-acre elevated storage and transfer station and yard. Ills. 2500 w. Eng Rec—Aug. 16, 1913. No. 44431.

Railway Terminals in Chicago. Describes some of the projects which have been under consideration and have been subjected to an engineer for examination and report. Maps. Also editorial. 5500 w. Eng News—July 31, 1913. No. 44112.

"Cotton Belt" Freight Terminal at St. Louis. Winters Haydock. Illustrated description of the freight house and track layout. The building occupies three city blocks and is five stories high. 1000 w. Ry Age Gaz—Aug. 8, 1913. No. 44255.

The Kansas City Terminal Railway. Maps and illustrated description of the new terminal system, station, yards, etc. 6000 w. Eng News—Aug. 7, 1913. No. 44248.

The Unification of the Freight Terminals of a Large City. George H. Kimball. A study of terminal conditions in and about Buffalo, N. Y. Ills. 7500 w.

Bul Am Ry Engng Assn—Aug., 1913. No. 45414 N.

Big Concrete Terminal for "Soo" Line. Illustrated description of a large freight terminal in Chicago. 3000 w. Cement Era—Oct., 1913. No. 45876.

Canadian Northern Montreal Terminal. Illustrated account of the driving of a tunnel 3.25 miles long under Mount Royal to reach the new passenger station. 2700 w. Ry Age Gaz—Oct. 10, 1913. No. 45774.

Locomotive Terminal for the Baltimore & Ohio R. R., Cumberland, Md. Illustrated description of a terminal designed with reference to needs in handling extra heavy modern power, consisting largely of locomotives of the Mallet and Mikado types. 1500 w. Ry & Engng Rev—Oct. 11, 1913. No. 45819.

Study for Unification of All Freight Terminals at Buffalo. A discussion of the general problem and details of a large clearing yard proposed in 1904. 4500 w. Eng Rec—Oct. 11, 1913. Serial, 1st part. No. 45812.

The Central Argentine New Terminal Station, Buenos Ayres. Illustrated detailed description. 2000 w. Ry Gaz. Lond—Oct. 3, 1913. No. 45846 A.

See also Chicago, Freight Terminals, Grand Central Terminal, Subway Construction and Yards, under *Permanent Way and Buildings*; and Terminals, under *STREET AND ELECTRIC RAILWAYS*.

See also Freight Terminals, under *Traffic*.

Testing Plant

A Maintenance-of-Way Department Railroad Testing Plant. B. B. Milner. Remarks on the deficiency of experimental work in this field, with suggestions. 2500 w. Jour Fr Inst—Aug., 1913. No. 44544 D.

A Maintenance Department Testing Plant. B. B. Milner. Suggestion for increasing the amount of experimentation on track construction as an aid to scientific design. 2200 w. Ry Age Gaz—Aug. 15, 1913. No. 44403.

Tie-Adzing

Automatic Sleeper-Adzing and Boring Machine. Illustrated description of a machine which under test was able to adze and bore six sleepers per minute. 800 w. Engng—Sept. 19, 1913. No. 45569 A.

Ties

Hard-Wood Inset Rail-Plates for Railway Ties (Hartholz-Einsatzplatte für Eisenbahnschwellen). M. Matthaei. Novel scheme for increasing cost of ties by inlaying dove-tailed hardwood sections. Ills. 2000 w. Glaser's Ann—Oct. 1, 1912. No. 37420 D.

Ties

PERMANENT WAY AND BUILDINGS

Track Appliances

Prolonging the Useful Life of Cross-Ties. Observations and recommendations pointing to possible economies in track maintenance. 3000 w. Eng Rec—Nov. 30, 1912. No. 37964.

Prolonging the Life of Cross-Ties. Discusses methods tending to prevent destruction by decay and by mechanical wear. 5000 w. Ry Age Gaz—Dec. 20, 1912. No. 38347.

Service Tests of Ties in Experimental Track. Reviews results published in a bulletin of the U. S. Forest Service which indicate that treatments have generally increased the durability of the ties. 2000 w. Ry Age Gaz—Feb. 21, 1913. No. 39984.

Report of Committee III—On Ties. Report concerning the effect of the design of tie-plates and spikes on the durability of ties, stresses, etc. Ills. 9000 w. Bul Am Ry Engng Assn—Jan., 1913. No. 40224 F.

Treating Plant for Central of Georgia. Illustrates and describes facilities at Macon, Ga., for preserving ties and timber by three alternative processes. 1000 w. Ry Age Gaz—Feb. 21, 1913. No. 39983.

The Laying of Rails on Wooden Sleepers for Busy Express Lines. E. C. W. Van Dijk. From *De Ingenieur*. Read before the Roy. Inst. of Dutch Engrs. Illustrated discussion of methods of laying rails. 7500 w. Bul Int Ry Cong—March, 1913. No. 40916 G.

Recent Practice on Reinforced Concrete Ties (Neu Erfahrungen mit Eisenbetonschwellen). R. Bastian. Details in the design and construction of specially reinforced cross-ties. Ills. Serial, 1st part. 2600 w. Beton u Eisen—Feb. 26, 1913. No. 40526 E.

The Galesburg Tie Plant of the C. B. & Q. Illustrated description of treating plants and the tie yard. 1800 w. Ry Age Gaz—April 18, 1913. No. 41352.

Comparative Economy of Treated Ties. R. J. Parker. Discusses the relative savings of treated and untreated ties, with and without tie plates and with cut and screw spikes. 2500 w. Ry Age Gaz—May 16, 1913. No. 42210.

Effect of Metal and Treated Ties on Track Circuits. From the report of the committee on signals and interlocking of the Am. Ry. Engng. Assn. 2200 w. Ry & Engng Rev—May 17, 1913. No. 42257.

New Tie Treating Plant, B. & O. R. R. F. J. Angier. Illustrated description of the plant at Green Spring, W. Va. 2000 w. Ry & Engng Rev—May 17, 1913. No. 42256.

Tie Renewals and Ballasting. Fourth of a series of articles on maintenance topics. Methods of handling tie renewals and ballasting are discussed. 1200 w. Ry Age Gaz—May 16, 1913. No. 42213.

Adzing and Boring Ties and the Cost of Installing Plants of This Kind. James A. Lounsbury. Brief discussion. 4000 w. Am Wood Pres Assn—Jan., 1913. No. 43277 N.

The Piecework or Unit System of Handling Ties and Timbers. W. W. Eldridge. Explains the object and the advantages of the piece work system. Discussion. Ills. 5000 w. Am Wood Pres Assn—Jan., 1913. No. 43274 N.

The Transmission of Air Pressure in Cross-Ties. Carlile P. Winslow. Describes methods and discusses results of experiments. Ills. 4000 w. Am Wood Pres Assn—Jan., 1913. No. 43276 N.

A Comparison of Zinc Chloride with Coal-Tar Creosote for Preserving Cross-Ties. Howard F. Weiss. Information on the merits and deficiencies of each. General discussion. 15500 w. Am Wood Pres Assn—Jan., 1913. No. 43265 N.

Recent Results with Reinforced-Concrete Sleepers. R. Bastian. Considers types tried in Italy and the conclusions; also German types using asbestos concrete. Ills. 4800 w. Bul Int Ry Cong—Sept., 1913. No. 45410 G.

Wooden Sleepers or Iron Sleepers. Mr. Rectanus. A comparison of cost of construction and maintenance. 2800 w. Bul Int Ry Cong—July, 1913. No. 43980 G.

Reinforced Concrete in Track Construction (Gewapend beton in den spoorweg-bouwenbouw). V. Jockin. Description of the several methods of making reinforced concrete ties in Europe and America. Ills. 8500 w. De Ingenieur—Oct. 11, 1913. No. 46099 D.

See also Timber Preservation and Forest Products, under CIVIL ENGINEERING, *Materials of Construction*, and Piece Work, under Industrial Economy.

Tool Houses

Fireproof Railroad Section Tool Houses. Describes various methods of construction, giving suggested detailed plans and cost. 2000 w. Ry Engng & Main of Way—Sept., 1913. Serial, 1st part. No. 45175.

Track Appliances

New Track Appliances. From a committee report to the Roadmasters' and Main of Way Assn. Deals with manganese steel, tie-plates, rail-frogs and other appliances. 3500 w. Ry & Engng Rev—Oct. 11, 1913. No. 45820.

Track Circuits

PERMANENT WAY AND BUILDINGS

Track Scales

Track Circuits

Track Circuits in India. Describes a novel use of track circuits. 1200 w. Ry Gaz, Lond—July 11, 1913. No. 43895 A.

Track Elevation

Track Elevation at Joliet, Ill. Describes the general plan of the work and details of the bridges and subways at street crossings. Ills. 4000 w. Eng News—May 8, 1913. No. 41943.

The Elevation of the Tracks of the Philadelphia, Germantown, and Norristown Railroad, Philadelphia, Pa. Samuel Tobias Wagner. Illustrates and describes interesting features of the work of abolishing grade crossings in the city of Philadelphia. 16000 w. Pro Am Soc of Civ Engrs—May, 1913. No. 42905 F.

Track Labor

The Track Labor Problem. F. L. Jandron. Discusses the present track employee and the reasons why he should be put on a definite footing in regard to wages. 4000 w. Ry & Engng Rev—April 19, 1913. No. 41367.

Efficiency of Maintenance of Way Labor. H. C. Landon. Discusses the problems of section and extra gang organization and methods of removing some of the defects. 2500 w. Ry Age Gaz—May 16, 1913. No. 42211.

Track Material

Material for Railway Construction (Die Baustoffe der Spurbahnen). A. Haarmann. A general résumé of track material with special attention to rail forms and steel cross-ties. Ills. 6300 w. Stahl u Eisen—Jan. 2, 1913. No. 40000 D.

Tracks

The Maintenance of Track. T. Thompson. The importance of good drainage, lining, surfacing and related matters are discussed in detail. 1800 w. Ry Age Gaz—Nov. 15, 1912. No. 37602.

Track Construction Methods and Costs. Jos. D. Evans. An illustrated account of present construction methods and system of supervision and cost-keeping on the Montreal Tramways Co.'s lines. 5500 w. Can Elec News—Nov., 1912. No. 37260 C.

The Formation, Constitution, Importance and Utilization of the Osnabrück Track Museum. Dr. Haarmann. Information concerning this museum, and concerning progress and improvements in tracks. Ills. 7200 w. Bul Int Ry Cong—Nov., 1912. No. 37709 G.

The Japanese as a Track Laborer. The sixth of a series of discussions of the characteristics of the various types of maintenance workmen. 2500 w. Ry Age Gaz—Nov. 15, 1912. No. 37604.

Stremmatograph Tests of Track Under Service Conditions. P. H. Dudley. A report of tests made. 2500 w. Bul Am Ry Engng Assn—Nov., 1912. No. 39562 N.

Notes on Staking Out Track Connections. W. H. Wilms. Gives solutions of maintenance engineering problems which avoid errors resulting from the use of field book methods. Diagrams. 3500 w. Ry Age Gaz—Jan. 24, 1913. No. 39403.

Standard Track-Work System. Earl Stimson. An account of a system applied on the Phila. division of the B. & O. railroad which has resulted in increased efficiency. 1500 w. Eng Rec—March 15, 1913. No. 40642.

Development in the Use of Screw Spikes. Illustrated description of this type of track construction, now used on 730 miles of track. 5000 w. Ry Age Gaz—March 14, 1913. No. 40661.

Third and Fourth Track Construction. Illustrated descriptions of the problems encountered on the N. Y. Central between Albany and New York. 1500 w. Ry Age Gaz—March 14, 1913. No. 40662.

English Track on the Pennsylvania Railroad. Jos. T. Richards. A report of a comparative test of English and American track under the same conditions. Shows that the English track did not last as long as the American type. Ills. 5000 w. Bul Am Ry Engng Assn—March, 1913. No. 40624 N.

Some Features of Double-Track Railroad Construction on the Chicago, Milwaukee and St. Paul Railway in South Dakota. F. W. Van Buskirk. Illustrated description of the work. 2500 w. Engng & Con—June 4, 1913. No. 42663.

Track Scale Specifications and Rules. Recommendations adopted by the American Railway Association provide a standard to which railroads can work. 5000 w. Ry Age Gaz—June 20, 1913. No. 43102.

Company-Force Work on the Louisville & Nashville Railroad. Brief illustrated description of special equipment and results on grade revision. 2000 w. Eng Rec—Aug. 9, 1913. No. 44244.

The Relation Between Load, Rail Profile and the Number of Cross Ties (Het verband tusschen de belasting, het spoorstaafprofiel en het aantal dwarsliggers). E. C. W. Van Dijk. Mathematical discussion on the theoretical construction of tracks. Diagrams. 10400 w. De Ingenieur—Aug. 23, 1913. No. 46095 D.

See also Curves, under *Permanent Way and Buildings*, and Tracks, under *STREET AND ELECTRIC RAILWAYS*.

Track Scales

Track Scales. H. T. Porter. Submits a proposed set of specifications for 46-ft.,

Track Tanks

150-ton, four-section track scale, and for a 60-ft., 150-ton, six-section track scale. 2000 w. Bul Am Ry Engng Assn—Aug., 1912. No. 37678 E.

Weighting Methods on the St. Louis & San Francisco. Abstract of statement by E. D. Levy to the Interstate Commerce Commission. Describes methods employed. 2500 w. Ry Age Gaz—Jan. 24, 1913. No. 39401.

Track Tanks

Design and Maintenance of Track Tanks. George W. Vaughn. Discussion of the location, length and width of troughs, the two types of heating systems, and roadbed drainage. 4500 w. Ry Age Gaz—April 18, 1913. No. 41349.

Track Tanks and Locomotive Scoops. Discusses the considerations governing their use, location and design, and the present standard practice. 3500 w. Eng Rec—April 5, 1913. No. 41118.

Tunnels

The Sand Patch Tunnel Improvements. Illustrated description of recently completed work on the B. & O. in crossing the summit of the Allegheny Mts. 4000 w. Ry Age Gaz—April 4, 1913. No. 41070.

The Railway Conquest of the Alps. A review of the conquest of the various Alpine ranges to date—from the Lemmering to the Loetschberg tunnel. Map and Ills. 3000 w. Ry Gaz, Lond—July 4, 1913. No. 43709 A.

Mt. Royal Tunnel, Canadian Northern Railway. S. P. Brown. Illustrated description of work at Montreal, in which record progress of 810 ft. of heading was made in 31 days. 3500 w. Eng Rec—June 28, 1913. No. 43301.

The Loetschberg Tunnel. Map and illustrated description of this new tunnel under the Bernese Alps. 1500 w. Engr, Lond—July 4, 1913. No. 43724 A.

See also same heading, under CIVIL ENGINEERING, *Construction*.

Turntables

Recent Practice in the Costs of Turntable Construction on American Railways. A summary of standard practice on 57 American railways. Ills. 95000 w. Engng & Con—Nov. 6, 1912. No. 37284.

Turntable Design. Condensed review presented by a committee to the Am. Ry. Bridge & Building Assn. Ills. 3500 w. Eng News—Dec. 5, 1912. No. 38065.

Utica, N. Y.

Utica General Improvement on the New York Central & Hudson River Railroad. Illustrates and describes changes,

PERMANENT WAY AND BUILDINGS**Yards**

including the elimination of grade crossings, new station, freight houses, yard and engine terminal. 5000 w. Eng Rec—May 31, 1913. No. 42642.

Water Service

Report of Committee XIII.—On Water Service. Considers especially deep well pumps, describing recent developments in pumping machinery. Also track. Ills. 13000 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40405 N.

Water Stations

Cost of the Standard Water Station of the Missouri Pacific Railway. David W. Stradling. Itemized data on cost of the usual type. Ills. 1000 w. Engng & Con—Oct. 22, 1913. No. 46133.

Water Tanks

See Track Tanks, under *Permanent Way and Buildings*.

Water Towers

See same heading, under CIVIL ENGINEERING, *Water Supply*.

Water Troughs

Railway Water Troughs. Reviews briefly the use of these troughs, and discusses the practice and difficulties which arise. 1500 w. Ry Gaz, Lond—May 23, 1913. No. 42745 A.

Widening

The Euston to Walford Widening. Brief illustrated description of new and widened lines on the L. & N. W. Ry. to be worked electrically. 500 w. Engr, Lond—Feb. 14, 1913. No. 40137 A.

Yards

Report of Committee XIV.—On Yards and Terminals. Gives typical situation plans of passenger stations, with analysis of working capacity; freight handling by mechanical means; design and operation of hump yards. Ills. 16000 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40406 N.

New Classification Yard at Winnipeg. Illustrated description of a gravity yard building for the Canadian Pacific designed for 12,000 cars capacity. 1800 w. Ry Age Gaz—April 18, 1913. No. 41348.

Influence of Bad Weather on the Work at Sorting and Shunting Yards. Dr. Sammat. Discusses measures to facilitate sorting even if the weather is bad. 6700 w. Bul Int Ry. Cong—May, 1913. No. 42263 G.

Reconstruction of Chicago Clearing Yard. Plan and description of a proposed enlargement. 1500 w. Eng Rec—June 28, 1913. No. 43306.

Boston & Maine Yard at Mechanicville. Illustrated description of the construction of a large hump yard with engine terminal, and transfer station. 2500 w. Ry Age Gaz—Oct. 24, 1913. No. 46200.

Agriculture

Agriculture

Agricultural Promotion Work of the Railways. Frank Andrews. Abstract from Bul. 100 of U. S. Dept. of Agri. Gives statistics showing the character and importance of the work. 3000 w. Ry Age Gaz—Nov. 15, 1912. No. 37599.

Agriculture, Manufactures and Railways. Abstracted from Bul. 39, of the Bureau of Ry. Economics. A study of capital values and net return of these industries. 4000 w. Ry Age Gaz—Nov. 1, 1912. No. 37245.

Annual Reports

The Pennsylvania and the New York Central. A study of the annual reports of both roads. Map. 3500 w. Ry Age Gaz—March 7, 1913. No. 40357.

Bulgaria

Bulgarian Railways (Die Staatsbahnen Bulgariens). Franz Manek. A review of systems, rolling stock and traffic. Ills. 1500 w. Zeit des Oest Ing u Arch Ver—Feb. 14, 1913. No. 40549 D.

Capitalization

Railway Capitalization and Traffic. H. T. Newcomb. Shows how the productivity of railway capital in the United States has tended to decline since 1907. 2200 w. Ry Gaz, Lond—Nov. 15, 1912. No. 37813 A.

City Traffic

See City Planning, and City Traffic, under CIVIL ENGINEERING, *Municipal*.

Clearing House

Reform of Railway Methods. A. W. Gattie. Abstract of a lecture to the Great Central Ry. Debating Soc. Considers the proposed Goods Clearing House for London. 2000 w. Ir & Coal Trds Rev—Nov. 1, 1912. No. 37552 A.

The Proposed Railroad Clearing House. From a book on R. R. Accounting, by W. E. Hooper. Information concerning the plan and the work. 5500 w. Ry Age Gaz—Jan. 17, 1913. No. 39201.

Coal Cars

An Analysis of the Coal-Car Situation. A. T. Shurick. Reviews the outlook for the coming season. 4000 w. Coal Age—Sept. 27, 1913. No. 45482.

Earnings

The Trend of Railway Earnings. Frank Haigh Dixon. Gives statistics showing that while the record of the past year is not good, there has been a change for the better. 2000 w. Ry Age Gaz—Dec. 27, 1912. No. 38630.

Economics

Railway Officers on the Situation. A symposium of the views of railway officers on subjects relating to the business outlook, regulation of wages, safety and

TRAFFIC

Freight Cars

railway facilities. Also editorial. 12800 w. Ry Age Gaz—Dec. 27, 1912. No. 38629.

Efficiency

Railway Efficiency. A. Crumpton. Read before the Can. Ry. Club. Discusses the ways in which railways fail in efficiency and how to increase the efficiency. 4000 w. Can Engr—Sept. 18, 1913. No. 45252.

Express Handling

Electric Express Handling at the North Station, Boston. Illustrated detailed description of electric truck service. 2000 w. Elec Wld—Feb. 15, 1913. No. 39883.

Express Rates

The Rates and Practices of Express Companies. Arthur S. Field. An account of the more important objects of complaint against the rates and practices of express companies, and the remedial changes. 10800 w. Am Ec Rev—June, 1913. No. 43285 H.

Freight

Prevention of Loss and Damage to Freight. Discusses the causes of loss and damage and the remedy. 3000 w. Ry & Engng Rev—Nov. 30, 1912. No. 37958.

Freight Car Tactics. Arthur Hale. Discusses the handling of freight cars. General discussion. 10500 w. Pro Cent Ry Club—Jan. 9, 1913. No. 39940 C.

Causes and Cure of Deficient Use of Freight Cars. L. F. Loree. An analysis showing only ten per cent utilization. 2500 w. Engineering Magazine—April, 1913. No. 40907 B.

Getting More Movement for Freight Cars. Arthur Hale. Suggestions regarding means of overcoming delays at terminals. 2500 w. Ry Age Gaz—Aug. 1, 1913. No. 44114.

Increasing Freight Car Efficiency. B. A. Worthington. Discusses the causes of delay to equipment in yards and means being used on the Chicago & Alton for remedying them. 1500 w. Ry Age Gaz—Aug. 29, 1913. No. 44806.

See same heading under STREET AND ELECTRIC RAILWAYS.

Freight Cars

Getting More Movement for Freight Cars. E. H. DeGroot, Jr., and F. M. Lucore discuss Arthur Hale's recent article, and suggest methods for increasing efficiency. Also editorial. 2200 w. Ry Age Gaz—Sept. 5, 1913. No. 44979.

Increasing Freight Car Performance. C. C. Riley. Explains the methods of investigation and supervision being used on the Baltimore & Ohio to reduce expenses and increase results. 2500 w. Ry Age Gaz—Sept. 26, 1913. No. 45442.

Consult Classification of the Index. See page 9.

Freight Handling

Uncle Sam's Freight Cars. J. Garrett Hill. Reprint from *Everybody's Mag.* Favoring the government ownership of railway freight equipment—but not of the railways. 1200 w. Ry Age Gaz—Sept. 5, 1913. No. 44981.

Freight Handling

Mechanical Handling of Baggage and Freight. Abstract of paper by William C. Carr and of the discussion before the New England R. R. Club. 1500 w. Ry Age Gaz—Nov. 8, 1912. No. 37329.

Street Freight Transport (Strassen-Güterzüge). W. A. Th. Müller. The possibilities of economic freight distribution by wagon trains drawn by motor trucks and traction engines. Ills. Serial, 1st part. 2500 w. Gläser's Ann—Jan. 15, 1913. No. 40047 D.

Mechanical Freight Handling of the New York Dock Co. Illustrated description of the rapid freight handling machinery recently installed. 1700 w. Ry & Engng Rev—April 19, 1913. No. 41366.

Relations Between the Goods Services on Main Railroads and on Light Railways. A. Campiglio. Deals with the effect of inequality between the mileages of goods upon railways and analyses the conditions of interchange of rolling stock, etc. 6700 w. Bul Int Ry Cong—May, 1913. No. 42261 G.

See same heading under MECHANICAL ENGINEERING, *Transporting and Conveying*; and *Clearing House and Freight Terminals*, under *Traffic*.

Freight Terminals

Freight Terminals and Freight Handling at Terminals. J. S. Busfield. A general description of the requirements and methods employed at some of the up-to-date terminals. Ills. 3500 w. Can Engr—May 8, 1913. Serial. 1st part. No. 41968.

Great Western Railway Goods Depot at South Lambeth, London. Illustrated detailed description of buildings and equipment. 1500 w. Ry Gaz, Lond—April 25, 1913. No. 41920 A.

Hungary

Impressions of Hungarian Railway Practice. Henry W. Jacobs. Shop emergency hospital, drinking fountains, an efficient apprentice system, and the labor situation are noteworthy. Ills. 2300 w. Ry Age Gaz—Feb. 21, 1913. Serial, 1st part. No. 39982.

Interchange

Rules of Interchange. Report of the committee on proposed changes in the rules of interchange. 18500 w. Pro W Ry Club—March 18, 1913. No. 41687 C.

Master Car Builders' Rules of Interchange. Report of committee on revision

TRAFFIC

of the rules with general discussion. Ills. 10000 w. Pro Cent Ry Club—March 14, 1913. No. 41268 C.

Car Efficiency. Jos. R. Cavanagh. Suggests the organization of a clearing house for keeping and clearing the accounts, and pooling all cars. 1200 w. Ry & Engng Rev—April 12, 1913. No. 41227.

Annual Report of the Standing Committee on Revision of M. C. B. Rules of Interchange. With discussion. 1200 w. Pro Ry Club of Pittsburgh—March 28, 1913. No. 42422 C.

Interstate Commerce

Interstate Commerce Commission's Annual Report. Reviews the recommendations for a physical valuation and for control over railway capitalization. 3000 w. Ry Age Gaz—Dec. 20, 1912. No. 38345.

Limitations of Commissions' Powers. H. T. Newcomb. Supreme Court decisions hold that Commission's orders must show the evidence on which they are based. 2500 w. Ry Age Gaz—Jan. 3, 1913. No. 38793.

Long Runs

Long Non-Stop Runs on Railways. A. Kuntzemüller. Considers the 1912 summer time tables in Germany. 2800 w. Bul Int Ry Cong—Jan., 1913. No. 39556 G.

Mail Rates

Mail Carrying Railways Underpaid. Abstract from a statement by committee on railway mail pay showing that compensation does not equal operating expenses. 4500 w. Ry Age Gaz—Nov. 15, 1912. No. 37600.

Merger Case

Union Pacific-Southern Pacific Merger Dissolved. Gives the full text of Justice Day's opinion in the unanimous Supreme Court decision in the Harriman Lines merger case. Also editorial. 85000 w. Ry Age Gaz—Dec. 6, 1912. No. 38067. N. Y., N. H. & H

New York, New Haven and Hartford. A review of this system and its operation, its financial policy and management. 2500 w. Ry Age Gaz—Dec. 13, 1912. No. 38182.

Ore Transport

An Interesting Transportation System. Map and illustrated study of the lines of the U. S. Steel Corporation from Minnesota mines to Pittsburgh mills. 5500 w. Ry Age Gaz—Sept. 19, 1913. No. 45258.

Parcel Post

Railroads and New Parcels Post Law. A statement by the Committee on railway mail pay. 1300 w. Ry Age Gaz—Dec. 13, 1912. No. 38190.

Railway Economics

TRAFFIC

Regulations

Railway Economics

The Steam Railroad. B. A. Worthington. Address delivered at the dedication of the transportation buildings, Univ. of Illinois. Discusses the railroad situation and the economic problems connected. 2700 w. Ry & Engng Rev—May 10, 1913. No. 41977.

Are Our Railroads Fairly Treated? A discussion before the Economic Club. Abstracts of remarks made by Prof. Ripley, Mr. Delano, and Mr. Bush. 5500 w. Ry Age Gaz—May 2, 1913. No. 41801.

The Railway Situation in the United States. Editorial review and comment on the situation as summed up by Slason Thompson, of the Bureau of Ry News and Statistics. 1600 w. Engng—April 25, 1913. No. 41931 A.

Railway Problems

The Needs of the Railways. Samuel O. Dunn. Discusses safety, capacity, improvements needed, capital, and other items. 5500 w. Ry Age Gaz—Feb. 21, 1913. No. 39979.

Railway Situation

The Railway Situation and Its Causes. Blewett Lee. Address before the Transportation Club of Indianapolis. Discusses causes and the outlook. 1800 w. Ry Age Gaz—Oct. 24, 1913. No. 46198.

Rate Regulation

Original Cost Versus Replacement Cost as a Basis for Rate Regulation. Raymond V. Hayes. Discusses phases of the cost theory as applied to rate regulation. 4000 w. Ry Age Gaz—Sept. 12, 1913. No. 45077.

Rates

The Course of Railway Rates Since 1870. William Z. Ripley. Reviews the changes in freight rates and discusses receipts per ton mile. Also editorial. 8000 w. Ry Age Gaz—Nov. 8, 1912. No. 37330.

Transcontinental Commodity Rates Increased. Gives full decision handed down by Interstate Commerce Commissioner Clements in the cases of rates from eastern shipping points to the Pacific Coast. 3500 w. Ry Age Gaz—April 4, 1913. No. 41072.

Freight Rates by Water and by Rail J. L. Payne. A comparison. 4500 w. Ry Age Gaz—April 18, 1913. No. 41346.

Supreme Court Decides Minnesota Rate Case. Decision on the power of a state to regulate rates within its own border. Also editorial. 2800 w. Ry Age Gaz—June 13, 1913. No. 42817.

Why Freight Rates Should Be Increased. Daniel Willard. From the Phila. *Public Ledger*. The heavy increase in expenses, rise in interest rates, and the need of larger earnings for proper

development. 2500 w. Ry Age Gaz—June 6, 1913. No. 42679.

The Question of Increased Freight Rates. A. B. Hulit. Outlines a plan for investigating the subject, and argues that an advance would help farmers. 3500 w. Ry Age Gaz—July 25, 1913. No. 43922.

Railroad Cost and Efficiency. A discussion of the question of allocating expenses to passenger and freight service. 1500 w. Ry Age Gaz—July 11, 1913. No. 43665.

Decision in the Express Rate Cases. Gives the opinion by Commissioner Marble ordering lower rates. 3500 w. Ry Age Gaz—Aug. 8, 1913. No. 44259.

Increased Transportation Rates and Needed Facilities. From an address by B. A. Worthington before the Cent. Mfr. Dist. Club of Chicago. 4500 w. Ry & Engng Rev—Oct. 11, 1913. No. 45821.

See also Clearing House and Valuation, under *Traffic*, and United States Waterways, under *CIVIL ENGINEERING, Waterways and Harbors*.

Records

A Practical Plan for Standardizing Railroad Records. F. Lincoln Hutchins. Outlines the elements of a practical standardization. 1800 w. Engineering Magazine—Aug., 1913. No. 43911 B.

Registering Machines

Registering Machines in the Railway Services. H. Marchand. Illustrated description of the machines. 2200 w. Bul Int Ry Cong—Aug., 1913. No. 44704 G.

Regulation

Some Aspects of Railway Regulation. Frank J. Loesch. Abstract of a paper read before the Soc. of Ry. Financial Officers. Discusses unjust railway legislation. 2500 w. Ry Age Gaz—Oct. 10, 1913. No. 45776.

Regulations

Freight Car Tactics or Regulations. Arthur Hale. Discusses the problems in the handling of freight cars and the need of tactics more than of rules. 4000 w. Ry Age Gaz—Jan. 24, 1913. No. 39400.

Regulation of Railways. W. W. Finley. Abstract of an address delivered at a dinner given by the Chamber of Commerce, New Haven, Conn. 35000 w. Ry Age Gaz—Feb. 7, 1913. No. 39716.

Regulation of Utilities by Commission. Halford Erickson. Abstract of a paper read before the Western Soc. of Engrs. The part dealing with the regulation of railroads. Principles that should be applied and methods used in dealing with service, rates, and financial return. 7000 w. Ry Age Gaz—March 28, 1913. No. 40944.

South Africa

TRAFFIC

Valuation

South Africa

Railways of the Union of South Africa. E. R. Lewis. Explains the organization, engineering, operating and financial features of a system of 9,050 miles, owned and operated by the government. 3500 w. *Ry Age Gaz*—May 16, 1913. No. 42209.

Statistics

Railroads. J. Hunt. Considers the railroads of the United States in relation to the rest of the world with regard to mileage, equipment, number of employees, accidents and finances. 1800 w. *Yale Sci M*—March, 1913. No. 40429 C.

Statement of Railway Administration for the Year 1913 (*Etat des Eisenbahnverwaltung für das Etatsjahr, 1913*). A statistical review of Prussian railway conditions. 5500 w. *Glassers Ann*—Feb. 1, 1913. No. 40522 D.

Results Obtained During 1912 on the Systems of the Five Principal Railway Companies of France (*Résultats obtenus en 1912 sur les réseaux des cinq Compagnies principales des Chemins de fer français*). Tabular statistics on the Nord, Est, Orléans, Paris-Lyon-Méditerranée and Midi railways. 14 pp. *Rev Gen des Chemins de Fer*—Aug., 1913. No. 45313 G.

Tonnage

Equated Tonnage Method of Making Up Freight Trains. E. C. McMillan. Explains the method and its advantages, and illustrates the Standard train resistance computer which embodies this principle. 2000 w. *Ry & Engng Rev*—Nov. 2, 1912. No. 37271.

Tables for Finding Proper Tonnage Rating. Paul M. La Bach. Gives acceleration and retardation figures, and their use in solving problems of railway location and train loading. 3300 w. *Ry Gaz, Lond*—Jan. 17, 1913. No. 39463 A.

Analysis of the Determination of Economical Freight Train Tonnages. Abstract from the report of R. N. Begren giving formulae and other deductions drawn from a series of dynamometer runs and a discussion of the conditions affecting train resistances. 3000 w. *Eng Rec*—March 22, 1913. Serial. 1st part. No. 40765.

Railway Construction and Train Tonnage. R. N. Begren. Abstract of a paper on "Dynamometric Tests in the B. & O. R. R. and Their Application to Tonnage Rating." Discusses the relation between train tonnage and physical characteristics of the road. 4000 w. *Eng News*—April 10, 1913. No. 41165.

United States

The Railways in the United States. C. Colson. A review of traffic questions. 9600 w. *Bul Int Ry Cong*—Jan., 1913. No. 39557 G.

Valuation

Railroad Valuation: Reproduction Cost Now as a Sole Basis for Rates. D. F. Jurgensen. Quotes the law bearing on the subject and discusses the correct method to be employed in valuing railroads. 4000 w. *Jour Assn of Engng Socs*—Dec., 1912. No. 38653 C.

State Official Co-operation to Secure Proper Valuation Under Act of Congress, March 1, 1913. D. F. Jurgensen. Short paper urging co-operation. 1000 w. *Jour Assn of Engng Socs*—July, 1913. No. 43998 C.

Misapplication of Interest, Contingencies and Engineering Items for Valuing Railroads by Cost of Replacement Method. D. F. Jurgensen. A reply to criticisms on an earlier paper. 2000 w. *Jour Assn of Engng Socs*—Aug., 1913. No. 44521 C.

The Railway Valuation Act. Gives the act passed by the U. S. Senate on Feb. 24, with editorial comment. 4000 w. *Eng News*—March 6, 1913. No. 40356.

Some Disputed Points in Railway Valuation. The present article considers the value of the "right of way." 1000 w. *Ry Age Gaz*—May 16, 1913. Serial. 1st part. No. 42208.

The Problem of Railway Valuation. Logan G. McPherson. Address at the banquet of the Am. Assn. of Freight Traffic Officers. Discusses the change in the public's attitude and the difficult question it has raised. 3500 w. *Ry Age Gaz*—May 23, 1913. No. 42356.

Physical Valuation of Railroads. William J. Wilgus. Considers the basic principles that should govern the work, and concludes that the reproduction new is the only measure that places all railroads on the same plane. 8000 w. *Pro Am Soc of Civ Engrs*—May, 1913. No. 42913 F.

Physical Valuation of Railroads. Discussion of the paper by William J. Wilgus. 5000 w. *Pro Am Soc of Civ Engrs*—Aug., 1913. No. 44791 F.

Physical Valuation of Railroads. Continued discussion of the paper by William J. Wilgus. 9000 w. *Pro Am Soc of Civ Engrs*—Sept., 1913. No. 45528 F.

Physical Valuation of Railroads. Continued discussion of paper by William J. Wilgus. 23500 w. *Pro Am Soc of Civ Engrs*—Oct., 1913. No. 46345 F.

Valuation of Steam Railroads. Discussion of the basic principles and of the

Valuation

proper treatment of the different items to be taken into account. 3000 w. Eng Rec—June 14, 1913. Serial. 1st part. No. 42824.

The Supreme Court's Comments on Valuation. In the Minnesota rate case the Supreme Court in the opinion by Justice Hughes discusses railroad valuation. 7000 w. Ry Age Gaz—June 20, 1913. No. 42997.

Assignment of Equipment Valuation by States. A. I. Thompson. Abstract of paper read before a conference of R. R. Commissioners of Miss. Valley States. Discusses phases of an assignment on the "use" basis. 2500 w. Ry Age Gaz—July 4, 1913. No. 43479.

The Theory of Reproduction Applied to Railway Rights of Way and Station Grounds. E. W. Reed. Points out inconsistencies in this theory. 2200 w. Eng & Con—Sept. 3, 1913. No. 44977.

The Indirect Results of National Railway Valuation. J. Shirley Eaton. Outlines the problems invited by the public valuation of railroads. 4500 w. Engineering Magazine—Nov., 1913. No. 46301 B.

Valuation of Railroads. Gridlev Bede. Shows the difference between cost and

MISCELLANY

Convention

value. 1500 w. Ry & Engng Rev—Oct. 18, 1913. No. 45962.

Railway Appraisal. Charles A. Whitney. Outlines methods used to determine reproduction cost and present value. 2500 w. Brooklyn Engrs' Club—1912. No. 46395 N.

See also same heading, under STREET AND ELECTRIC RAILWAYS.

Wages.

The Inadequacy of Railway Mail Pay. Facts presented before the Congressional Committee by W. A. Worthington showing unfairness of compensation to railroads. 1200 w. Ry Age Gaz—April 25, 1913. No. 41642.

See same heading and Arbitration, under INDUSTRIAL ECONOMY.

Warehouse Trucks

See also same heading, under STREET AND ELECTRIC RAILWAYS, and Electric Trucks, under MECHANICAL ENGINEERING, Automobiles.

Weighing

Weighing Methods on an Eastern Trunk Line. Describes the organization and method of handling scales and weighing. 1600 w. Ry Age Gaz—May 2, 1913. No. 41803.

MISCELLANY

African Railways

Some Features of the West African Government Railways. Frederic Sheldford. Description, with discussion and correspondence. Map. 83 pp. Inst of Civ Engrs—No. 3976. No. 39299 N.

Alaska

Transportation Facilities in Alaska. Duncan M. Stewart. An explanation of the situation in Alaska. 7500 w. Pro Am Min Cong—Nov. 25-29, 1912. No. 44066 N.

Transportation Facilities in Alaska. Duncan M. Stewart. An explanation of the needs of Alaska, and the legislation necessary for its development. 7500 w. Pro Am Min Cong—1912. No. 46183 N.

See also same heading, under MINING AND METALLURGY, Coal and Coke.

Bolivia

Railroads and Transportation Problems in Bolivia. G. W. Wepfer. Map and description of conditions and possibilities of the mining industry. 1500 w. Min & Sci Pr—July 19, 1913. No. 43853.

Canada

Canada's Most Successful Railway Year. J. L. Payne. A detailed study showing the growth of mileage, facilities, traffic and earnings during the year end-

ing June 30, 1912. 5000 w. Ry Age Gaz—Jan. 24, 1913. No. 39398.

On the Intercolonial Railway of Canada. Brief illustrated sketch of the railway and principal repair shops. 1500 w. Ry & Loc Engng—April, 1913. No. 41026 C.

Capitalization

Are American Railroads Overcapitalized? Alba B. Johnson. A comparison of conditions in Europe and America. 3500 w. Ry Age Gaz—Aug. 15, 1913. No. 44401.

Conservation

Report of Committee on Conservation of Natural Resources. Report for the Dominion of Canada, considering the planting and reforestation, prevention of fires from railways, coal resources, peat, natural gas, etc. 2500 w. Bul Am Ry Engng Assn—Feb., 1913. No. 40402 N.

Convention

Traveling Engineers' Association. Report of the Chicago convention, Aug. 12-15, with abstracts of papers read. 10000 w. Ry Age Gaz—Aug. 22, 1913. No. 44539.

American Association of Railroad Superintendents. Report of discussions on car efficiency and train movement, interchange rules and handling of explosives.

Consult Classification of the Index. See page 9.

Dissolution

4000 w. Ry Age Gaz—Aug. 29, 1913. No. 44807.

Traveling Engineers' Convention. Report of the meeting, with abstracts of committee reports and papers. 15000 w. Ry Age Gaz (Mech Ed)—Sept., 1913. No. 44955 C.

Dissolution

The Union Pacific Plan as Approved. Gives the final decree of the court in the Union Pacific—Southern Pacific, and reasons for approving. 2000 w. Ry Age Gaz—July 4, 1913. No. 43476.

Dutch East Indies

State Railroads of the Dutch East Indies. D. C. Alexander, Jr. Extracts from a Consular Report giving information concerning the railroads on the islands of Java and Sumatra. 3000 w. Ir Age—Dec. 5, 1912. No. 38041 C.

Education

A Short Course in Railway Civil Engineering. C. C. Williams. Gives a brief outline of courses offered in railway engineering at the University of Colorado. 3500 w. Bul Soc for Pro of Engng Ed—May, 1913. No. 44826 N.

University of Cincinnati Co-operative Course in Railway Engineering. Describes these courses which have been in operation a number of years, discussing results. Ills. 1800 w. Ry Age Gaz—Aug. 15, 1913. No. 44408.

Moving Pictures in Railway Educational Work. D. C. Boy. An account of the educational work of the Central of Georgia R. R. Mr. Pendergast explained views illustrating the subject of fuel economy and proper locomotive firing. Discussion. 7200 w. Pro S & S W Ry Club—May, 1913. No. 44375 C.

England

The Cromford and High Peak Railway. An illustrated account of one of the most elevated lines in England, its engineering features, equipment and history. 3000 w. Engr, Lond—Nov. 22, 1912. No. 38036 A.

Examinations

Civil Service Examination for Positions in Railway Valuation. Information concerning the positions to be filled and the requirements. 3300 w. Ry & Engng Rev—June 21, 1913. No. 43153.

Forests

Mountain Forests and Railways (Gebirgswälder und Eisenbahnen.)—F. X. Burri. A study of the interrelation on the protection afforded by the forests, the ready marketing of forest products, and the damage from denuded hillsides. Ills. Serial. 1st part. 1600 w. Schweiz Bau—Feb. 15, 1913. No. 40529 D.

MISCELLANY

Queensland

France

Notes on French Railway Practice. Henry W. Jacobs. Information based on a visit to the locomotive and car repair shops of the Paris, Lyons & Mediterranean Ry. at Paris. 3000 w. Ry Age Gaz—Dec. 6, 1912. No. 38068.

See also Public Ownership, under *Miscellany*.

Germany

Impressions of German Railway Practice. Henry W. Jacobs. Remarks on the handling of locomotives at terminals, the economizing of fuel and the care of employees. 2500 w. Ry Age Gaz—Jan. 3, 1913. No. 38794.

The Prussian-Hessian State Railways. W. J. Cunningham. Description and discussion of their management, service, rates, and financial results. Also editorial. 10000 w. Ry Age Gaz—April 25, 1913. No. 41638.

Great Western Ry.

Seventy-First Anniversary of the Great Western Railway. Reviews the development of the system. Ills. 2500 w. Ry Gaz, Lond—June 6, 1913. No. 42882 A.

India

Development of the East Indian Railway. Lewis R. Freeman. Map, and illustrated account of the railway development. 2500 w. Ry Age Gaz—Aug. 1, 1913. No. 44116.

See same heading, under *MINING AND METALLURGY, Coal and Coke*.

Mexican Railways

An Engineer's Reminiscences of Mexican Railway Building. Max E. Schmidt. An account of characteristics of the country and people. Ills. 3000 w. Engineering Magazine—Aug., 1913. No. 43914 B.

Peru

The Railways of Peru. O. Sperber. Map and descriptive account of the railways. Ills. 1500 w. Ry & Engng Rev—July 26, 1913. No. 43937.

Public Ownership

Results of Public Ownership in France. Yves Guyot. From the Annual Financial Review of the N. Y. Times. Shows that the working is more costly than had been anticipated and the service unsatisfactory. 1800 w. Ry Age Gaz—Feb. 7, 1913. No. 39713.

Queensland

Sir Thomas Robinson on Queensland's Railways. From a paper read before the Royal Colonial Inst. Describes the development of the railways. 2000 w. Ry Gaz, Lond—Dec. 13, 1912. No. 38387 A.

Consult Classification of the Index. See page 9.

Railroad Contracts**Railroad Contracts**

How to Start on a Railroad Contract. Daniel J. Hauer. Discussion of methods to follow. 3000 w. Con Rec—Sept. 10, 1913. No. 45066.

Railway Museum

A Visit to the Railway Museum in Berlin. Henry W. Jacobs. Illustrated account of the exhibits and their value for instruction. 1200 w. Ry Age Gaz—Dec. 20, 1912. No. 38342.

Regulation

The Limitations of Regulation. Editorial review of the Interstate Commerce Commission's report on its New England situation investigation. 2200 w. Ry Age Gaz—July 18, 1913. No. 43795.

MISCELLANY**Review of 1912**

Railways. Reviews the construction during 1912. 5000 w. Engr, Lond—Jan. 3, 1913. No. 39168 A.

Storekeepers' Assn.

Railway Storekeepers' Association. Report of the convention at Chicago, with papers, reports, and business transacted. 1500 w. Ry Age Gaz—May 23, 1913. No. 42357.

Waste

Wasting a Million a Day. M. Gesundheit. Considers the need of efficiency engineering methods in the conduct of our railroads. Ills. 4500 w. Cassier's—July, 1913. No. 43348.

Waste

STREET AND ELECTRIC RAILWAYS

Accident Prevention

Accident Prevention

Accident Prevention in Boston. Edward Dana. Explains the campaign of education to prevent street car accidents. Ills. 2500 w. Elec Ry Jour—Jan. 11, 1913. No. 39109.

Accidents

Successful Methods of Preventing Accidents. Arthur G. Rippey. Abstract of a paper read before the Iowa Elec. Ry. Assn. Discusses methods of preventing accidents on city and interurban railways. 4000 w. Elec Ry Jour—April 26, 1913. No. 41678.

Accounting

Statistical Units Used in Analysis of Electric Railway Accounts. James A. Emery. Abstract of paper read before the Am. Elec. Ry. Assn. Reviews the advantages and disadvantages of the various units. 3000 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45926.

Accumulator Cars

The Introduction of Accumulator Motor Traction on the Lines Mülheim-Ruhr (Heissen)—Osterfeld-Nord und Mülheim-Ruhr (Heissen)—Hattingen, and Notes on the Question of the Economy of Motor Traction (Die Einführung des Accumulator-Triebwagenbetriebes auf den Strecken Mülheim-Ruhr—Heissen—Osterfeld-Nord u. Mülheim-Ruhr—Heissen—Hattingen und Beitrag zur Frage der Wirtschaftlichkeit des Triebwagenbetriebes). E. Borghaus. Line construction, cars and service rendered. Ills. 6000 w. Glaser's Ann—Aug. 15, 1913. No. 46010 D.

Accumulators

A Storage Battery Train in New York. Report of a demonstration run between the Pennsylvania passenger station and Long Beach, L. I., with description of the cars and their equipment. Ills. 1200 w. Tram & Ry Wld—Nov. 14, 1912. No. 37803 B.

The Stepless Storage Battery Car. Illustrated description of a center-entrance four-wheel car of ingenious design on the New York Railways. 2000 w. Elec Ry Jour—Nov. 23, 1912. No. 37778.

Accumulator Traction

See same heading, under RAILWAY ENGINEERING, *Motive Power and Equipment*, and Electric Traction, under STREET AND ELECTRIC RAILWAYS.

Berlin

Australia.

The Electrification of the City and Suburban Roads of Melbourne (Die Elektrisierung der Stadt- und Vorortbahnen von Melbourne). G. Brecht. A comprehensive description of the changes. Map. 5000 w. Elek Kraft u Bahnen—Feb. 14, 1913. No. 40565 D.

The Tramways of Sydney, New South Wales. C. O. Burge. Brief illustrated description of the system in use. 2000 w. Tram & Ry Wld—Nov. 14, 1912. No. 37800 B.

Automotrice

The Gasoline-Electric Automotrice. Francis E. Drake. Reviews the development of these self-propelled passenger cars. Ills. 1500 w. Elec Jour—Jan., 1913. No. 39440.

Axles

Breaking of Car-Wheel Axles. A. A. Blackburn and H. Vernon. Describes the various causes to which the breaking of steel axles are attributed and the means adopted in the effort to overcome the trouble. Ills. 3500 w. Tram & Ry Wld—Nov. 14, 1912. No. 37801 B.

See also Wheels, under STREET AND ELECTRIC RAILWAYS.

Bearings.

Railway Motor Bearings and Their Care. W. E. Johnson. Consideration of design and material, machinery and fitting, babbiting and oil grooving to obtain satisfactory results. Ills. 3500 w. Elec Trac—March, 1913. No. 40717.

Berlin

Berlin Means of Communication. Illustrates and describes present traffic arrangements and some proposed improvements. 3500 w. Tram & Ry Wld—Feb. 6, 1913. No. 40118 B.

The Opening of the Spittelmarkt-Alexanderplatz Line of Berlin's Elevated and Subway (Zur Eröffnung der Strecke Spittelmarkt-Alexanderplatz der Berliner Hoch- und Untergrundbahn). G. Kemman. Description, plans, profile, equipment and construction of this new line. Ills. 4000 w. Elek Kraft u Bahnen—Aug. 4, 1913. No. 44684 D.

Notes on the Electrification of Berlin's Local, Circle and Suburban Lines (Betrachtungen zur Elektrisierung der Berliner Stada-, Ring- und Vorortbahn-

Consult Classification of the Index. See page 9.

Boston Elevated

en). Ph. Pforr. Brief outline of proposed work. 1600 w. Elek Kraft u Bahnen—Nov. 14, 1912. No. 38469 D.

Boston Elevated.

Recent Improvements on the Boston Elevated System. Illustrated description of extensions of the lines since the completion of the Cambridge subway. 5000 w. Elec Ry Jour—March 1, 1913. No. 40283.

Recent Improvements of the Boston Elevated System. A continuation of the description, including the new office building, the new Stadium station, etc. Ills. 2500 w. Elec Ry Jour—March 8, 1913. No. 40376.

See Cars, under STREET AND ELECTRIC RAILWAYS.

Brakes

The New York City Brake Order. J. N. Dodd. Report of tests and opinions in regard to the order that all passenger cars weighing more than 25,100 lbs. be equipped with air brakes. 4000 w. Elec Ry Jour—Sept. 13, 1913. No. 45132.

Buenos Aires

Traffic Problems in Buenos Aires. Illustrated description of the underground railway, explaining the conditions which made it a necessity. 1200 w. Engr, Lond—Nov. 15, 1912. No. 37831 A.

Cable Laying

Cable Installations of City Railways (Die Kabelführung städtischer Schnellbahnen). Herr Brugsch. Examples of electric cables for street, subway and elevated tracks. Ills. 2600 w. Elek Kraft u Bahnen—July 14, 1913. No. 44681 D.

California

First Section of New California System. Rudolph W. Van Norden. Illustrated detailed description of interurban electric lines which will connect Sacramento Valley with tidewater. 6500 w. Elec Trac—Feb. 1913. No. 39891.

Canada

The Windsor, Essex and Lake Shore Rapid Railway. Illustrated description of a single-track line in Ontario, its construction, maintenance and operation. 2000 w. Can Engr—Dec. 12, 1912. No. 38273.

Notes on the Windsor, Essex and Lake Shore Rapid Railway. Maintenance records are given for Canada's first single-phase railway. Ills. 2000 w. Elec Ry Jour—Nov. 30, 1912. No. 37971.

Car Design

Recent Developments in Street Car Design. Illustrates and describes recent types, most of them having a center entrance. 3000 w. Ry & Engng Rev—Dec. 14, 1912. No. 38225.

Car Equipment.

Maintenance of Electrical Equipment of Cars in Brooklyn. Describes recent improvements made in the maintenance of motor and control equipments. Ills. 5500 w. Elec Ry Jour—March 15, 1913. No. 40686.

Car-Ferries

See Ferries, under MARINE AND NAVAL ENGINEERING.

Car Heating

Heating and Ventilating Cars. A. L. Bostwick. Briefly considers methods in use in ten of the important cities of the United States. 1500 w. Munic Jour—Feb. 6, 1913. No. 39676.

Thermostat Heat Regulator Test. Report of tests made by the Chicago Rys. Co., describing apparatus, methods, etc. 3000 w. Elec Trac—July, 1913. No. 43811.

Carhouses.

Pierce Street Carhouse of the Omaha & Council Bluffs Railway. Illustrated description of a double-deck carhouse of reinforced concrete construction. 2500 w. Elec Ry Jour—Feb. 8, 1913. No. 39742.

The Derby Carhouse of the Connecticut Company. Illustrated description of a structure for storing cars, built on the bed of a diverted stream and designed to exert the minimum weight upon its foundations. 2500 w. Elec Ry Jour—Feb. 22, 1913. No. 39988.

Fond du Lac Avenue Carhouse of the Milwaukee Electric Railway & Light Company. Detailed account of a modern carhouse. Ills. 2200 w. Elec Ry Jour—March 15, 1913. No. 40687.

Luzerne Carhouse of the Philadelphia Rapid Transit Company. Illustrated description of a unit-type reinforced concrete structure for 336 cars, with separate buildings for stores, sand handling, heating and transportation purposes. 1800 w. Elec Ry Jour—June 28, 1913. No. 43317.

New Headquarters Carhouse of the Union Street Railway. Illustrates and describes interesting features of a recently completed structure. 2500 w. Elec Ry Jour—Aug. 23, 1913. No. 44700.

Car House, Shop and Office Building at Dayton. Illustrated description of Oakwood Street Ry's station. 2000 w. Elec Trac—Sept., 1913. No. 45512.

Old and New Carhouses at Berlin, Germany. Illustrated descriptions showing recent changes in construction standards. 1200 w. Elec Ry Jour—Oct. 4, 1913. No. 45713.

See also Shops, under STREET AND ELECTRIC RAILWAYS.

Consult Classification of the Index. See page 9.

Car Lighting**Car Lighting**

Economic Lighting of Street Cars. S. G. Hibben and E. M. Smith. Commending the Mazda lamp Alba-shade equipment. 1200 w. Elec Jour—June, 1913. No. 43224.

Modern Practice in Street Railway Illumination. S. G. Hibben. Reviews past and present practice in street car lighting, and the recent introduction of standard tungsten lamps with downward reflecting shades. Ills. 3500 w. Ill Engng Soc—Sept., 1913. No. 46375 N.

Cars

Cleveland Center-Entrance Trail Car. Illustrated description of cars recently put in service. 1200 w. Elec Ry Jour—Nov. 30, 1912. No. 37972.

New Demonstration Car for Chicago Railways Company. Illustration, with brief description. 1200 w. Elec Trac—Jan., 1913. No. 39222.

New Cars for Vienna Street Railways (Neue Motorwagen bei den städtischen Strassenbahnen in Wien.) Ludwig Spangler. Dimensions and plans of new single- and double-deck cars and trailers. Ills. 2200 w. Elek Kraft u Bahnen—Jan. 24, 1913. No. 40060 D.

Single-Deck and Double-Deck Prepayment Cars for Vienna. Illustrates and describes single-deck motor and trailer cars with separate exits and entrances, and a double-deck drop-platform car with one inside stairway to the upper deck. 1200 w. Elec Ry Jour—Aug. 2, 1913. No. 44137.

Plans of Double-Deck Cars and Automobile Omnibuses for the Vienna Street Railways (Entwürfe für stockhohe Triebwagen und Automobil-Omnibusse bei den Wiener städtischen Strassenbahnen). Ludwig Spangler. Dimensions and arrangements and comparisons with New York and Pittsburgh cars. Ills. 6600 w. Elek kraft u Bahnen—Sept. 4, 1913. No. 46088 D.

An Improved Type of Articulated Car. Illustrates and describes a novel design developed by the Boston Elevated Ry. 1000 w. Elec Ry Jour—March 29, 1913. No. 40948.

Center-Entrance Cars for Brooklyn. Illustrated detailed description of the construction and equipment of 100 cars for the Brooklyn Rapid Transit Co. 3000 w. Elec Ry Jour—April 19, 1913. No. 41363.

The Electric Cars on the Lines of the Noord-Zuid-Hollandsche Tramway Company in Haarlem (De motorwagens voor de lijnen der Noord-Zuid-Hollandsche Tramwegmaatschappij in Haarlem). W. J. Burgersdijk. Details of overhead con-

City Service

struction of these cars. Ills. 1900 w. De Ingenieur—May 3, 1913. No. 42166 D.

Petrol-Electric Trams. Illustrated description of the Tilling-Stevens cars for the London County Council. 1200 w. Tram & Ry Wld—June 5, 1913. No. 43144 B.

New Double-Deck Cars for Pittsburgh. Illustrated detailed description of cars recently purchased. 2500 w. Elec Ry Jour—May 31, 1913. No. 42622.

Recent American Street Railway Cars (Neuere Amerikanische Strassenbahnwagen). H. Nordmann. Description of the new center-entrance and double-decked cars in New York and Pittsburgh. Ills. 11000 w. Elek Kraft u Bahnen—May 24, 1913. No. 43048 D.

New Light-Weight Express Cars of the Bav State Street Railway. Illustrated detailed description of new rolling stock to provide maximum capacity. 1500 w. Elec Ry Jour—Sept. 27, 1913. No. 45501.

Self-Propelled Cars. Illustrates and describes the present commercial forms of gasoline, gas-electric, and storage-battery cars, giving statistics of performance. 9000 w. Elec Ry Jour—Oct. 4, 1913. No. 45721.

A Car Designed for the New Subway. Illustrated description of a design claiming to give 42% more seats and 100% more standing room. 600 w. Sci Am—Oct. 4, 1913. No. 45612.

Design of City Cars. Illustrates and describes recent modifications due to the adoption of the prepayment system for fares, and a tendency to use steel. 6500 w. Elec Ry Jour—Oct. 4, 1913. No. 45716.

Los Angeles Center Entrance Cars. E. L. Stephens. Illustrates and describes a new type of car remodeled from the older types. 700 w. Elec Jour—Oct., 1913. No. 46322.

See also Accumulators, under STREET AND ELECTRIC RAILWAYS.

Chicago

Service Equipment and Operation in Chicago. Abstract of a report by the Board of Supervising Engrs. Considers improvements in service. 3500 w. Elec Ry Jour—Aug. 16, 1913. No. 44473.

City Service

Train Operation for City Service. Observations on a series of tests by the Public Service Railway of New Jersey to determine whether the operation of two-car trains is desirable. 2000 w. Elec Ry Jour—July 5, 1913. No. 43463.

Train Operation in City Service. F. M. Loud. Explains conditions in Newark, N. J., and the solution of the problem.

Consult Classification of the Index. See page 9.

Cleveland, O.

Ills. 2000 w. Elec Jour—Oct., 1913. No. 46323.

Report on the Joint Committee on Train Operation for City Service. Abstract of a report read before the Am. Elec. Ry. Assn. 1700 w. Elec Ry Jour—Oct. 15, 1913. (Daily Ed.) No. 45905.

Urban Passenger Transport. J. B. Hamilton. Read before the Munic. Tram. Assn., Sheffield. Discusses cost of operation of tram cars and motor omnibuses in the towns of the United Kingdom. 5000 w. Elect'n, Lond—Oct. 3, 1913. No. 45841 A.

Urban Passenger Transport. J. B. Hamilton. Read before the Munic. Tram. Assn. Deals with the respective revenues and expenses from working tramways and motor omnibuses in large towns. Discussion and reply. 17000 w. Tram & Ry Wld—Oct. 16, 1913. No. 46241 B.

Cleveland, O.

Electric Power in Cleveland. Illustrated account of changes with a description of the 60-cycle, 1500 kw. rotary converters. 3000 w. Elec Ry Jour—April 5, 1913. No. 41106.

Composite Rails

Composite Rail Laying on Chicago Street Railways; the Economics of Composite Rails. Description and discussion. Ills. 800 w. Engng & Con—Dec. 4, 1912. No. 38051.

Congestion

Financial Aspects of the Relief of Congestion by the Construction of Subways and Viaducts. Charles S. Sergeant. Abstract of paper read before the Am Elec Ry Assn. 1600 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45925.

Connecticut Lines

Traffic Improvements of the Connecticut Company. An illustrated account of the consolidation of various trolley lines, with an analysis of the financial and operating results secured. 6000 w. Elec Ry Jour—Aug. 16, 1913. No. 44472.

Constantinople

The Future Electric Railway in Constantinople and Its Proposed Route Along the European Banks of the Bosphorus (Die zukünftige elektrische Schnellbahn für Konstantinopel und seine am europäischen Ufer des Bosphorus gelegenen Vororte). E. Brugsch. Description of proposed line. Ills. 3300 w. Elek Kraft u Bahnen—Nov. 4, 1912. No. 38467 D.

Construction

Supporting an Electric Railroad on the Edge of a Side Hill. Walter Loring Webb. Illustrated description of the method adopted at Oil City, Penn., to solve a vexing engineering problem. 900 w. Eng News—Feb. 6, 1913. No. 39706.

Electric Traction**Control**

The Control of Electric Trains and Tramcars. Considers the merits and demerits of some of the systems in common use. 3000 w. Engr, Lond—Jan. 10, 1913. No. 39268 A.

Recent Developments in Railway Control. F. E. Wynne. Abstract of paper before the Cent. Elec. Ry. Convention. Describes the "P K" equipment and operation, field-control operation, and states advantages. 2000 w. Elec Ry Jour—July 5, 1913. No. 43464.

See same heading, under RAILWAY ENGINEERING, Conducting Transportation.

Controllers

Pneumatically-Operated Drum Controllers. A. J. Hall and L. G. Riley. Brief descriptions of types, with detailed description of the "P. K." type controller used on the stepless cars of the New York railways. Ills. 2200 w. Elec Jour—Oct., 1913. No. 46325.

Costs

Electric Railway Costs. John B. Sparks. Suggests that all power costs be entirely separated from transportation expenses, and presents results from three railways. 2500 w. Elec Ry Jour—June 14, 1913. No. 42848.

See Pension Systems, under INDUSTRIAL ECONOMY.

Dynamotor Compressor

The Dynamotor-Compressor. Ralph E. Ferris. Illustrates and describes the machine, explaining how it performs the duties for which two or three machines were formerly required. 2500 w. Elec Jour—Oct., 1913. No. 46330.

Electric Traction

Heavy Electric Traction on the Continent. Summarizes recent electrification work of the various continental governments. 2500 w. Elec Ry Jour—Jan. 4, 1913. No. 38828.

Electrification of the Berlin City Circular and Suburban Railways. The official report of the Parliamentary Committee. 3000 w. Ry Gaz, Lond—Jan. 3, 1913. Serial. 1st part. No. 39144 A.

The Electrification of Melbourne Railways. Information from the last report by Mr. Charles Merz, dealing with the system of electric traction most suitable for the Melbourne railways and the financial results of their conversion to electric working. Map and ills. 5000 w. Tram & Ry Wld—Dec. 12, 1912. No. 38867 B.

Some New Traction Methods (Eenige nieuwere wijzen van tractie). E. F. Suringer. Recent developments in accumulator cars, and in oil-driven generator cars.

Consult Classification of the Index. See page 9.

Europe

Ills. 7000 w. De Ingenieur—March 8, 1913. No. 41504 D.

See also Electrification, under RAILWAY ENGINEERING, *Motive Power and Equipment*.

Europe

Discussion on "Some Impressions of the Electric Traction Situation in Europe." The paper by C. E. Eveleth is discussed at Schenectady, N. Y., May 17, 1912. 4500 w. Pro Am Inst of Elec Engrs—Nov., 1912. No. 37901 F.

Express Service

Electric Express Service at Boston. Illustrated description of trolley express and freight facilities of commercial importance. 1500 w. Elec Ry Jour—Dec. 21, 1912. No. 38379.

Express and Freight Traffic in Providence, R. I. Illustrated account of the methods and description of special facilities for the service. 2000 w. Elec Ry Jour—March 29, 1913. No. 40947.

Fare Collection

Advantages and Disadvantages of Platform Fare Collection. Alderman S. Flint. Read before the Munic. Tram. Assn., Sheffield. Considers the subject in relation to conditions in England. 3000 w. Elect'n, Lond—Oct. 3, 1913. No. 45839 A.

Fares

Fare Accounting. Letters from accounting officials discussing present practice and opportunities for improvement. 7500 w. Elec Ry Jour—Oct. 4, 1913. No. 45718.

Feeders

Interconnected Systems Feeding Railway Load. Illustrated description of the network of Waterbury-New Britain system of Connecticut Company supplied from three hydroelectric and two steam stations. 2500 w. Elec Wld—March 1, 1913. No. 40256.

Feeder Tests

Feeder Tests on the San Diego Electric Railway. H. Macnutt. Describes apparatus and methods used. Ills. 900 w. Elec Ry Jour—July 26, 1913. No. 43944.

Field Control

Field Control Equipment of the Michigan United Traction Company. E. A. McElheny. Describes the motors and control equipment. 1800 w. Elec Jour—Oct., 1913. No. 46334.

Finance

Reserves and Operating Conditions of Electrical Railways (Rücklagen und Betriebsergebnisse der elektrischen Bahnen). Arthur Ertel. Comparing reserves, amortization and credit of private and public roads. 5500 w. Elek Kraft u Bahnen—Nov. 24, 1912. No. 38473 D.

Hamburg**France**

An Electric Railway in the French Pyrenees. Alfred Gradenwitz. Illustrated detailed description of an interesting mountain railway. 4500 w. Elec Rev, Lond—Aug. 8, 1913. No. 44445 A.

Freight

Report of the Committee on Express and Freight Traffic. Abstract of report before the Am. Elec. Ry. Assn. Discusses questions in connection with freight and express business. 2500 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45923.

Transportation of Freight. Deals with all phases of freight traffic. Ills. 12000 w. Elec Ry Jour—Oct. 4, 1913. No. 45719.

Funeral Cars

Recent Funeral Cars. Illustrates and describes cars used in Philadelphia and in Milwaukee. 1000 w. Elec Ry Jour—Dec. 7, 1912. No. 38094.

Grades

Grade Reduction on Street Railways. Carl H. Reeves. Illustrates and describes difficult work at Seattle, Wash. 2500 w. Eng News—Jan. 9, 1913. No. 38950.

Great Britain

Tramways of the United Kingdom. A. J. Lawson. An analysis of the financial position of the tramways, examining capital expenditure, cost of construction and equipment, traffic revenue, appropriations, rates, etc. 3500 w. Elect'n, Lond—Aug. 8, 1913. Serial, 1st part. No. 44447 A.

Hamburg

The Hamburg Elevated and Underground Railway. Illustrations and information concerning the provision made for local passenger traffic. 900 w. Sci Am Sun—Jan. 11, 1913. No. 39106.

Hamburg Subway and Elevated Railway. Map of the route and illustrated description of the character of construction adopted for the way and stations. 1800 w. Elec Ry Jour—March 8, 1913. No. 40377.

Shops and Carhouses of the Hamburg Rapid Transit System. Illustrates and describes the constructional and maintenance features of these buildings. 2500 w. Elec Ry Jour—March 15, 1913. No. 40684.

Power Equipment of the Hamburg Rapid Transit System. Brief illustrated description of the power station, substations, and transmission for the 800-volt d.c. operation of this elevated and underground railway. 2000 w. Elec Ry Jour—July 5, 1913. No. 43462.

Hamburg Elevated & Subway System. This fourth and concluding article de-

High-Tension

scribes the principal features of the cars, schedules, rates of fare, and the growth of traffic. Ills. 1500 w. Elec Ry Jour—Aug. 2, 1913. No. 44136.

High-Tension

High-Tension Continuous Current Traction. L. Gratzmuller. (Abstract.) Considers this system and its possibilities. 3500 w. Elect'n, Lond—May 30, 1913. No. 42768 A.

High-Tension Continuous Current Traction. L. Gratz-Muller. Read at Joint Meeting in Paris. Discusses this system and its possibilities of development. 9500 w. Engng—June 20, 1913. No. 43390 A.

Holland

A 1200-Volt D. C. Line in Holland. Illustrated description of the Leyden-Katwyk-Noordwyk railway. The entire overhead construction is of copper or bronze because of atmospheric conditions. 1200 w. Elec Ry Jour—Jan. 25, 1913. No. 39411.

Inspection

Inspection of Railway Apparatus. L. E. Schumacher. Outlines methods of inspection. 2200 w. Elec Jour—Oct, 1913. No. 46328.

Instructions

Instruction of Trainmen on the Houston Electric. Describes the schoolroom equipment and course of instruction to prospective trainmen. Ills. 2000 w. Elec Ry Jour—Sept. 27, 1913. No. 45500.

Interurban

Belt Lines of Illinois Traction System. Illustrates and describes engineering features of the four belt lines recently completed, at Decatur, Springfield, Edwardsville, and Granite City. 2000 w. Elec Ry Jour—Nov. 16, 1912. No. 37607.

The Henderson Extension of the Evansville Railways. Illustrated description of the engineering and operating features of a new line at Henderson and Owensboro, Ky., connecting these cities with Evansville, Ind. Describes the car ferry and the rolling stock. 1500 w. Elec Ry Jour—Nov. 23, 1912. No. 37777.

Nashville-Gallatin Interurban Railway. Illustrated description of new 1200-volt system through Tennessee blue grass district. 2000 w. Elec Trac—Dec., 1912. No. 38546.

New 1200-Volt Line Between Nashville and Gallatin, Tenn. Describes the longest interurban railway in Tennessee, which shows novel features in track, repair shops, substation, cab signal system and rolling stock. Ills. 2500 w. Elec Ry Jour—Aug. 2, 1913. No. 44135.

Engineering and Operating Features of the Tri-City Railway, Davenport, Ia.

Interurban

Illustrated description of an inter-state street railway. Also a new 30-mile 1200-volt interurban line. 3500 w. Elec Ry Jour—Dec. 28, 1912. No. 38689.

New Waterloo-La Porte Interurban Line. Illustrated description of a 20-mile extension of the Waterloo, Cedar Falls & Northern Ry. 3500 w. Elec Trac—May, 1913. No. 42232.

Possibilities of Increasing Profits on Interurban Tramways. E. H. Eduardes. Read before the Light Rys. Assn. Discusses how tramway costs can be reduced and receipts increased. 2800 w. Elect'n, Lond—June 20, 1913. No. 43372 A.

New 40-Mile Extension of the Waterloo, Cedar Falls & Northern Railway. Illustrated account of a 600-volt d.c. interurban line in Iowa. 2500 w. Elec Ry Jour—July 19, 1913. No. 43830.

Determination of Probable Operating Revenue. Louis E. Fischer. An analytical study of the probable operating revenue of a proposed interurban railway, based upon an examination of results obtained from existing lines. 5500 w. Elec Ry Jour—Aug. 23, 1913. No. 44701.

Power for Interurban Railroad. Illustrated description of electricity developed by steam turbines at Fraser, Ia., used for running trains, operating mines, and driving industrial plants. 1800 w. Prac Engr, Chicago—Aug. 15, 1913. No. 44419.

Quick Change-Over from 12000 Volts to 33,000 Volts. Illustrated account of work on lines in Indiana. 1000 w. Elec Wld—Aug. 23, 1913. No. 44565.

The Kansas City, Clay County, & St. Joseph Railway. Illustrated detailed description of an important electric railway recently completed in Missouri. 7500 w. Elec Ry Jour—Aug. 9, 1913. No. 44286.

Building a 1200-Volt Electric Railway. Robert F. Woods. Illustrated review of the problems of design and construction in the building of the Kansas City, Clay County and St. Joseph Ry. 4500 w. Eng News—Oct. 9, 1913. No. 45796 C.

Oakland, Antioch & Eastern Railway. Ralph W. Van Norden. Illustrates and describes interesting features of this new interurban line in California. 6000 w. Elec Trac—April, 1913. No. 41329.

Oakland, Antioch & Eastern Railway. C. E. Heise and G. B. Kirker. Illustrated description of a high class interurban electric railway for fast transportation between San Francisco and Sacramento. 2000 w. Elec Jour—Oct., 1913. No. 46317.

Oakland, Antioch & Eastern Ry. Illustrated description of an electric inter-

Italy

urban railway in California, built for high speed and heavy traffic. 1600 w. Ry & Engng Rev—Oct. 25, 1913. No. 46220.

Italy

The Giovi Line and Chiapella Station. Reviews briefly the use of electricity for traction in Italy, and illustrated description of the electric locomotives. 1500 w. Engr, Lond—Aug. 29, 1913. Serial, 1st part. No. 45041 A.

Load Factor

The Limiting Load Capacity of City Railways (Die Grenzen der Leistungsfähigkeit von Stadt-Schnellbahnen). Herrn Brugsch and Briske. General discussion of the load factor in railway operations. Charts. 2600 w. Elek Kraft u Bahnen—Sept. 24, 1913. No. 46092 D.

London

Central London Railway Extension to Liverpool Street. Plans and illustrated description, with particulars of the work. 2500 w. Engr, Lond—Nov. 29, 1912. No. 38133 A.

Increased Facilities in London's System Since the Introduction of Electric Power (Betriebsverstärkungen auf dem Bahnnetz des Londoner Innenringes seit Einführung elektrischer Zugkraft). G. Kemmann. Description of London traffic facilities. Maps. Serial. 1st part. 5500 w. Elek Kraft u Bahnen—Nov. 4, 1912. No. 38468 D.

London's Early Local Railways. Brief review of their history. 2000 w. Engr, Lond—Jan. 10, 1913. No. 39269 A.

London's Underground Electric Railways. Reviews the past year's results of the electric railway companies of London. 2500 w. Ry Gaz, Lond—March 7, 1913. No. 40706 A.

The Bus v. Tram Controversy, and Other Aspects of the London Traffic Problem. Discussion on whether trains or buses offer the better facilities for passenger transportation in London. Map. 10000 w. Soc of Engrs—Feb. 3, 1913. No. 40389 N.

Lubrication

Brooklyn Car Equipment Lubrication. Deals with lubrication changes, the storing and distributing the lubricant in the motors, etc. Ills. 2500 w. Elec Ry Jour—Dec. 7, 1912. No. 38093.

Maintenance

A System of Maintenance Records for Electric Railway Equipment. T. M. Childs. Gives systems for records of oiling, inspection, and other reports. 1000 w. Elec Jour—Oct., 1913. No. 46333.

Operation**Management**

Scientific Management Applied to Electric Railways. Deals with efficiency engineering methods employed by several companies to obtain greater operating economies. 12000 w. Elec Trac—Sept., 1913. No. 45506.

Scientific Methods in Electric Railway Promotion. John A. Meeker. Outlines the principles required for the successful financing of a project. 1000 w. Elec Trac—Sept., 1913. No. 45508.

Scientific Management on Chicago Railways Company. Describes results secured through efficiency engineering methods. 2000 w. Elec Trac—Sept., 1913. No. 45507.

Mine Effects

See same heading, under CIVIL ENGINEERING, *Municipal*.

Motors

Maintenance Costs of Old and New Railway Motors. J. C. Thirlwall. A comparison of the costs of operating old and modern types of motors in city and interurban service. 2500 w. Elec Ry Jour—Sept. 27, 1913. No. 45502.

Newcastle, Eng.

Newcastle-upon-Tyne Tramways Extensions. J. McKellar. Read before the Munic. & Co. Engrs. Describes the method of construction and maintenance work. 3000 w. Surveyor—May 16, 1913. No. 42534 A.

New South Wales

Sydney City and Suburban Railways. Map and description of the conditions which make the problem difficult. 2500 w. Engng—May 16, 1913. No. 42539 A.

New York, Westchester and Boston

The Westchester Railway Lines and Structures. First of two articles illustrating and describing an electric suburban railroad built for heavy traffic. 2000 w. Eng News—June 5, 1913. Serial. 1st part. No. 42697.

Oil System

New Oil Storage and Distribution System of Chicago Railways. Illustrated description of a central storage tank, which delivers to tank cars, and then to a novel oil car. 1500 w. Elec Trac—Jan., 1913. No. 39223.

Operating Expense

Estimating Operating Expense and Cost of Construction. Louis E. Fischer. Analytical study of the probable operating expense and cost of construction of a proposed electric interurban railway. 7500 w. Elec Ry Jour—Sept. 6, 1913. No. 45004.

Operation

A comparison of Cars and Trains for Street Railway Service. Committee re-

Consult Classification of the Index. See page 9.

Oregon

port at the recent Chicago convention of electric railway associations dealing only with city service. 2200 w. Eng News—Nov. 28, 1912. No. 37941.

Oregon

Construction of the Portland, Eugene & Eastern Ry. Mark Woodruff. Map and detailed description of electric railway to give transportation facilities to the Willamette valley of Oregon. 2000 w. Ry & Engng Rev—May 10, 1913. No. 41975.

The Oregon Electric Railway. Illustrated description of a line equipped with 1200-volt apparatus operating between Portland and Eugene, a distance of 122 miles. 2500 w. Elec Ry Jour—June 14, 1913. No. 42847.

Panama

First Electric Railway System in Panama. Illustrates and describes interesting features of recently completed lines. 2500 w. Elec Trac—Aug., 1913. No. 44439.

Parcel Carrying

Bradford City Tramways Parcel Department. Illustrated detailed description of the system and its uses. 1600 w. Tram & Ry Wld—May 8, 1913. No. 42277 B.

Paris

The Metropolitan Railway of Paris (Le Chemin de Fer Métropolitain de Paris). M. K. Godfernaux. Review of additions, improvements, rolling stock, plant equipment, etc. 11's. and plates. 16500 w. Rev Gén des Chemins de Fer—Oct., 1912. No. 37493 G.

Changes in the Paris Tramway System by the Compagnie Générale des Omnibus (La transformation des réseaux d'omnibus et de tramways de la Compagnie Générale des Omnibus de Paris). A. Bidault des Chaumes. Describes present features of the service. 11's. 4500 w. Génie Civil—Dec. 7, 1912. No. 38492 D.

The Transformation in the Municipal Railway Systems of Paris (La Transformation du Réseau Municipal de Tramways a Paris). A. Mariage. Part 1, gives an historical summary of the service from 1854 to 1910. Part 2, presents a complete study of the system under electrification. 11's. and Plate. 90 pp. Mem Soc Ing Civ de France—March, 1913. No. 43077 G.

Paving Maintenance

The Maintenance of Paving on Tramway Track as Affected by Section 28 of the Tramway Act, 1870. William C. Fenton. Read before the Munic. Tram. Assn., Sheffield. Discusses reasons for revision and objections to revision. 2500

Power Stations

w. Elect'n, Lond—Oct. 3, 1913. No. 45840 A.

The Maintenance of Paving on Tramway Track as Affected by Section 28 of the Tramway Act, 1870. William C. Fenton. Deals with the present aspect of this question in England. Also discussion. 16000 w. Tram & Ry Wld—Oct. 16, 1913. No. 46240 B.

Peak Loads

Review of Peak loads on Electric Power Plants. Edward P. Burch. Brief consideration of their cause, reduction, and economical handling. 3000 w. Elec Trac—Sept., 1913. No. 45510.

Philadelphia

Rapid Transit Report on Philadelphia. Gives recommendations of A. Merritt Taylor in regard to the construction of subway and elevated lines at a total cost of about \$60,000,000. Map. 2500 w. Elec Ry Jour—Aug. 9, 1913. No. 44287.

Power Generation

Power Generation and Transmission. Illustrated review of recent changes in design and construction. 12500 w. Elec Ry Jour—Oct. 4, 1913. No. 45715.

Report of the Committee on Power Distribution. Abstract of report read before the Am. Elec. Ry. Engng. Assn. at Atlantic City, N. J. 4500 w. Elec Ry Jour—Oct. 14, 1913. (Daily Ed.) No. 45884.

Report of the Committee on Power Generation. Abstract of report before the Am. Elec. Ry. Assn. Suggests arrangement to protect power plants from shut-downs, and discusses matters related. 2500 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45924.

Power Plant

An Interurban Railroad Power Plant. G. D. Crain, Jr. Illustrated description of a plant at Louisville, Ky., which operates, in and around the city, electric lines with a total length of single track reaching 261,459 miles. 2500 w. Mfr's Rec—March 6, 1913. No. 40327.

Power Stations

Power-Generating Equipment on the Cleveland, Painesville & Eastern Railroad. Illustrates and describes a recently consolidated system having novel features, and supplying power for lighting and industrial service as well as for cars. 2200 w. Elec Ry Jour—July 19, 1913. No. 43829.

Improvements in Power Station at Omaha, Neb. Illustrated description of the extension to the main generating plant of the Omaha & Council Bluffs Street Ry. Co. 2000 w. Elec Trac—Sept., 1913. No. 45509.

Power Plant of Springfield (Mass.) Street Railway Co. W. O. Rogers. Illus-

Providence, R. I.

trated description of a plant supplying electrical energy to operate about 175 miles of street railway. 600 w. Power—Sept. 2, 1913. No. 44901.

Providence, R. I.

Recent Improvements in the Electric Railway System of Providence, R. I. Illustrated account of improvements including the introduction of pay-as-you-enter system, automatic block signals on single-track lines, and other features. 4500 w. Elec Ry Jour—July 12, 1913. No. 43690.

Rail Corrugation

Rail Corrugations. H. T. Wakelam. Read before the Inst. of Munic. & Co. Engrs. A discussion of the causes of this trouble. Ills. 7500 w. Surveyor—Dec. 13, 1912. No. 38392 A.

Rail Corrugation. Editorial comment with summary of opinions and conclusions in Great Britain as to the cause of the trouble. 2200 w. Eng News—Nov. 28, 1912. No. 37942.

The Source of Corrugation in Rails (Die Ursache der Riffelbildung an Schienen). F. Martens. Describes tests and studies tending toward the theory of hard spots as the cause of corrugation. Ills. 3000 w. Stahl u Eisen—July 10, 1913. No. 44603 D.

Rail Grinding

Grinding Rails on Street Railways. Describes conditions of rails in Chicago and the methods employed for restoring a smooth-running surface. Ills. 2000 w. Eng News—Nov. 28, 1912. No. 37940.

Railless

Rotherham Trolley Busses. Illustrates and describes features of interest in this omnibus system. 1500 w. Elec Rev, Lond—Oct. 25, 1912. No. 37286 A.

Rail-less Traction Legislation. H. England. Examines in detail various provisions in the bills introduced. Discussion. 4500 w. Elect'n, Lond—June 20, 1913. No. 43374 A.

Rails

Continuous Rail for Chicago Street Traction. An interesting story of a rush order. Ills. 2500 w. Sci Am Sup—March 29, 1913. No. 40963.

T-Rail in Paved Streets. R. C. Cram. Shows the connection between T-rail construction and types of paving. 3500 w. Elec Ry Jour—Sept. 6, 1913. No. 45001.

See Composite Rails, under STREET AND ELECTRIC RAILWAYS.

Railway Economics

Economics of the Cleveland Railway Situation as Developed in the 1913 Arbitration Decision. C. Nesbit Duffy. Abstract of a paper read before the Am. Elec. Ry. Assn. Reviews the questions

Shop Practice

involved and reasons why the franchise plan did not prove successful. 4000 w. Elec Ry Jour—Oct. 15, 1913. (Daily Ed.) No. 45903.

Rapid Transit

Rapid Transit Development in Berlin and New York. Review of subway and elevated lines. Maps. 1500 w. Elec Ry Jour—Sept. 6, 1913. No. 45003.

Repair Shops

Repair Shop of the New York, Westchester and Boston Railway. Illustrated description of the building and equipment for the maintenance of high-speed suburban cars of unusually large size and constructed of steel throughout. 4000 w. Elec Ry Jour—Dec. 14, 1912. No. 38207.

San Francisco

Reports on San Francisco Conditions. Reports on traffic conditions and the future needs. 6500 w. Elec Ry Jour—Jan. 11, 1913. No. 39110.

Final Report on San Francisco. Concluding report of B. J. Arnold on transportation conditions in San Francisco, with recommendations. 8500 w. Elec Ry Jour—May 10, 1913. No. 41972.

San Francisco Municipal Railway. Official statement of the cost of construction and the operation. Map. 3000 w. Elec Ry Jour—Oct. 11, 1913. No. 45883.

Schedules

The Shortest Train Schedule for City Service Considering Train Lengths (Die Kürzeste Zugfolge für städtische Schnellbahnen unter besonderer Berücksichtigung der Zuglänge). W. Bethge. A series of charts outlining possible schedules on elevated, subway and street lines. 2200 w. Elek Kraft u Bahnen—April 14, 1913. No. 42155 D.

Seattle

Improvements to a Cable Road in Seattle. Notes upon the operating features of cable lines in streets with heavy grades. Electricity replaces steam for the cable drive. Ills. 1000 w. Elec Ry Jour—June 21, 1913. No. 43118.

Sheffield, Eng.

The Tramway System of Sheffield. Illustrated detailed description and history of the development. 5000 w. Tram & Ry Wld—Sept. 11, 1913. No. 45293 B.

Shop Practice

Brooklyn Motor, Truck and Brakeshoe Improvements. Third article of a series on work of the Brooklyn Rapid Transit Co. Describes practice in reborer motor shells, types of bearings and brasses used, truck changes, etc. Ills. 2000 w. Elec Ry Jour—Jan. 18, 1913. No. 39228.

Repair Shop Practice at Portland, Ore. F. P. Maize. Illustrated description of new shops, their equipment and man-

Consult Classification of the Index. See page 9.

Shops

agement. 2500 w. Elec Ry Jour—July 26, 1913. No. 43943.

Shops

New Shops of Montreal Tramways Co. Illustrated description of Youville shops at Montreal, Que. 4000 w. Elec Trac—March, 1913. No. 40716.

Scientific Design of Carhouses and Shops. C. A. Neff and T. P. Thompson. Drawings and description of methods used in planning an electric railway maintenance plant. 3000 w. Eng Rec—March 15, 1913. No. 40641.

New Paint Shop of the Detroit United Railways. Illustrated detailed description of a shop of modern design. 4500 w. Elec Ry Jour—April 12, 1913. No. 41202.

Kenmore Shops of the Northern Ohio Traction & Light Company. Jay C. Lathrop. Illustrated description of the new car maintenance plant near Akron. 3500 w. Elec Ry Jour—Oct. 18, 1913. No. 46126.

Repair Shop Design and Operation. Illustrations, diagrams and description of recent designs of repair shops, discussing tendencies in shop practice. 6500 w. Elec Ry Jour—Oct. 4, 1913. No. 45717.

Recent Repair Shop Improvements at Minneapolis. Gives an illustrated description of new structures, with notes on present shop practice. 1500 w. Elec Ry Jour—Oct. 11, 1913. No. 45880.

Signaling

Contact Signaling for Electric Railways. Carl P. Nachod. Explains the advantages of a trolley contact system. 2000 w. Elec Trac—Dec., 1912. No. 38547.

Electric Signaling in the Case of Tramways (La Signalisation électrique en matière de Tramways) Paul Philippart. Requirements of service, some systems in present usage and especially the Samaia system. Ills. 6400 w. Soc Belge d'Elec—Jan, 1913. No. 41509 E.

Electric Railway Signaling. Describes the most recent developments in block signaling. Ills. 11500 w. Elec Ry Jour—Oct. 4, 1913. No. 45720.

Report of the Joint Committee on Block Signals for Electric Railways. J. M. Waldron, Chairman. Abstract of report before the Am Elec Ry Assn. 1500 w. Elec Ry Jour—Oct. 15, 1913. (Daily Ed.) No. 45904.

Single Phase

Single-Phase and Direct-Current Railway Working. Editorial on the controversy in regard to the two systems of electric railway working; the decisions in different countries, and the divided opinion in Great Britain. 2000 w. Engng—Jan. 3, 1913. No. 39157 A.

South Carolina

Telephone Disturbances on Single-Phase Railways and Certain Phenomena in Single-Phase Generators. Dr. F. Marguerre. Abstract trans. from *Elek Zeit*. Discusses disturbances in Norway, the cause, and how the trouble can be overcome. 3500 w. Elect'n, Lond—Feb. 7, 1913. No. 39905 A.

A New Single-Phase Railway in Norway. An account of the electrification of the Rjukan Ry. in the south of Norway. 1000 w. Engr, Lond—March 14, 1913. No. 40834 A.

The Mittenwald Single-Phase Railway. Illustrated description of this section in the Tyrol, which is notable for beautiful Alpine scenery, and the construction of which involved some very difficult work. 2500 w. Engr, Lon—Feb. 21, 1913. No. 40316 A.

Two European Single-Phase Railways. Illustrated description of the Mittenwald Electric Railway and the Rjukan Railway. 2000 w. Elec Rev, Lond—Feb. 28, 1913. No. 40464 A.

Overhead Equipment for Single-Phase Railways. Illustrates and describes work carried out by Vedovelli, Priestley, et Cie. 2500 w. Engr, Lond—April 25, 1913. No. 41933 A.

Single-Phase Traction. M. Latour. (Abstract.) Considers briefly the mechanical construction of single-phase locomotives and the erection of overhead conductors. 1500 w. Elect'n, Lond—May 30, 1913. No. 42769 A.

Single-Phase Traction. Marius Latour. Paper discussed at the Paris joint meeting. Mechanical construction of single-phase locomotives and the erection of overhead conductors are discussed; also disturbance caused to telephone and telegraph lines, etc. 4500 w. Engng—July 18, 1913. No. 43968 A.

Single-Phase Traction. M. Latour. Paper read at Paris before joint meeting. Remarks on the mechanical construction of single-phase locomotives, and erection of overhead conductors; discusses disturbances caused to telephone and telegraph lines, etc. 4500 w. Mech Engr—June 20, 1913. No. 43379 A.

Traction by Monophasé Current (Sur la traction par courant monophasé). Marius Latour. Mechanical considerations; contact lines, motors, commutation, etc. Diagrams. Discussion. 9000 w. Bul Soc Int d Electriciens—May, 1913. No. 43565 F.

See also Electrification, under RAILWAY ENGINEERING, Motive Power and Equipment.

South Carolina

The Rehabilitation of Augusta-Aiken Railway & Electric Corporation's System.

Consult Classification of the Index. See page 9.

Spain

E. C. Deal. Illustrated description of the complete equipment of generating station and sub-stations, methods of switching and transmission, etc. 4800 w. So Elect'n—Feb., 1913. No. 39874.

Spain

The Pamplona-Sanguesa Interurban (Die Ueberlandbahn Pamplona-Sanguesa). Herr Wagenknecht. Details of grade and line of the first single-phase Spanish railway, 56 kilometers long. Ills. 2000 w. Elek Kraft u Bahnen—June 14, 1913. No. 43546 D.

Standardization

Standardization on the Michigan United Traction. Illustrated description of the organization and methods employed in rehabilitating track and roadway. 2500 w. Elec Ry Jour—March 15, 1913. No. 40685.

Standardization of Special Work in Kansas City. A. E. Harvey. Gives standards of Met. Street Ry. Co. 2500 w. Elec Trac—Sept., 1913. No. 45511.

St. Louis

Report on United Railways of St. Louis. Deals with financial operations and valuation. 4500 w. Elec Ry Jour—Feb. 8, 1913. No. 39744.

Substations

New 3000-K. W. Substation in Fort Worth, Texas. Illustrated description of a recently completed substation, which shows interesting features of design, arrangements and wiring. 1500 w. Elec Ry Jour—Sept. 13, 1913. No. 45131.

Subways

Excavation and Timbering on Section 2, Lexington Avenue Subway. Illustrated description of work in N. Y. City where excavation is made under temporary street decks. 3000 w. Eng Rec—Dec. 14, 1912. No. 38197.

Building a Four-track Tunnel Beneath Broadway, New York. Sectional view and description of the work. 1600 w. Sci Am—Feb. 15, 1913. No. 39884.

The Railway Tunnels of New York City. Alfred Noble. An outline of the several railway tunnel and subway systems in New York City, describing particularly the construction of the tunnels under the rivers. Ills. 11000 w. Jour Fr Inst—April, 1913. No. 41284 D.

The Lexington Avenue Subway Four-track Tunnel Under the Harlem River. Illustrates and describes briefly some important sub-aqueous tunneling. 1200 w. Sci Am—March 29, 1913. No. 40962.

Double Tube Passage Under the Seine (Double passage tubulaire sous la Seine). M. M. Bechmann and Masson. Detailed report of the construction during 1906 to

Switzerland

1909 of this subway for carrying the Nord-Sud Electric Ry. of Paris. Ills. and Plates. 16000 w. Ann d Ponts et Chaussées—Jan., 1913. No. 41506 E + F.

The Pittsburgh Subway Problem. William Glyde Wilkins. Considers the subject from the engineering and economic standpoint only, discussing questions of location, and financial and economic features. General discussion. 2300 w. Pro Engrs' Soc of W Penn—May, 1913. No. 42916 D.

Alameda Avenue Subway in Denver. Illustrates and describes the construction and gives unit costs. 1500 w. Eng Rec—July 19, 1913. No. 43787.

Chicago's Alternate Plans for City-Owned Passenger Subways. William J. Shanks. Information concerning proposed ordinances for the construction of passenger subways. 1400 w. Engng & Con—Aug. 6, 1913. No. 44209.

Unit Subway Construction in Kansas City. Illustrates and describes subways built in reconstruction to eliminate grade crossings. The separate members are cast at a specially built slab plant. 2000 w. Eng Rec—Aug. 30, 1913. No. 44890.

Floating and Sinking the Harlem River Section of the New York Subway. Illustrates and describes how a 4-track tube was placed in 60 feet of water without compressed-air tunneling. 3000 w. Eng Rec—Sept. 13, 1913. No. 45109.

The Electric Interurban Subway Between Sampierdarena, Genoa and Quarto (Linea sotterranea elettrica interurbana fra Sampierdarena Genoa e Quarto dei Mille). Description of the line, construction adopted, stations, and costs. Ills. and Map. 2000 w. Ingeg Ferroviaria—July 15, 1913. No. 45370 D.

See also Subway Construction, under RAILWAY ENGINEERING, Permanent Way and Buildings, and Tunnels, under CIVIL ENGINEERING, Construction.

Subway Stations

Sanitary Features of New Subway Stations. H. M. Oman. Illustrated description of a typical layout, and of ventilation of stations and tunnels. 1500 w. Met Work—Aug. 22, 1913. No. 44545.

Switzerland

The Zweisimmen-Lenk Railway (Le chemin de fer Zweisimmen-Lenk). R. Zehnder-Sporry. Maps, profile and general description of this electric road. 1800 w. Bull Tech d l Suisse Romande—Nov. 10, 1912. No. 37507 D.

Notes on the Bernina Electric Railway (Note sur le chemin de fer électrique de la Bernina). J. Sheriaud. Brief outline of rolling stock, maintenance of way, and snow difficulties along the line. Ills.

Terminals

2200 w. Rev Gen des Chemins de Fer—Jan., 1913. No. 39081 G.

Terminals

Report on Cincinnati Terminal Possibilities. Gives B. J. Arnold's recommendations for the erection of individual joint terminals for freight and passenger service, respectively, a subway line using the bed of the Miami and Erie Canal, and several connections with steam and electric lines. 5500 w. Elec Ry Jour—Feb. 22, 1913. No. 39990.

Proposed Street Railway Terminal for Newark. Plans and description. 900 w. Elec Ry Jour—Feb. 8, 1913. No. 39743.

The Efficiency of Terminals in City and Suburban Traffic (Die Leistungsfähigkeit von Kopfbahnhöfen im Stadt- und Vorortverkehr). G. Brecht. Suggested terminal arrangements for increasing efficiency. Diagrams. 3000 w. Elek Kraft u Bahnen—April 14, 1913. No. 42156 D.

Three-Phase

The Progress of Three-Phase Traction on Tramways. Explains the main points to which the induction motor and the three-phase system in general owe their success and considers applications of the system. 2000 w. Elec Rev, Lond—June 13, 1913. No. 43128 A.

Tires

Specifications for Tramway Tyres. H. J. Skelton. A discussion of results in England due to the absence of a standard specification suitable for tramway work. 2000 w. Tram & Ry Wld—Nov. 14, 1912. No. 37802 B.

Tracks

Street Railway Track Work at Toledo. A. Swartz. Illustrates and describes some double-tracking work on a busy street, also repairs and maintenance. 2000 w. Eng News—Dec. 5, 1912. No. 38063.

Special Trackwork Calculations. Ernest Larmuth. Notes covering most of the problems of permanent way engineers in tramway track work. 1200 w. Tram & Ry Wld—Jan. 9, 1913. No. 39385 B.

Street Railway Tracks of Reinforced Concrete (Strassenbahngleise aus Eisenbeton). Max Buchwald. Describes various current methods of imbedding the rails in reinforced concrete. Ills. 2200 w. Beton u Eisen—Dec. 14, 1912. No. 39018 E.

A Brief Description of a Modern Street Railway Track Construction. Continued discussion of A. C. Polk's paper. Ills. 2000 w. Pro Am Soc of Civ Engrs—Feb., 1913. No. 40172 F.

Methods and Costs of Constructing Three Types of Paving for Street Railway Tracks. D. B. Davis. Describes methods and the costs of types of paving

Traffic Methods

built in Richmond, Ind. Ills. 1500 w. Engng & Con—March 19, 1913. No. 40727.

Track Maintenance and Reconstruction in San Francisco. Illustrates and describes interesting track appliances and machinery for removing paving, old rail and track foundations and for laying new tracks and paving. 3000 w. Elec Ry Jour—March 15, 1913. No. 40683.

Parabolic Junctions for Street Tracks (sui raccordi parabolici per tracciati stradali). Giulio Stahlini. A study of intersection curves for street railways. Diagrams. 5000 w. Monit Tec—Mar. 30, 1913. No. 41534 D.

Loose Checks or Guards on Tram Rails. W. R. Millar. Illustrates and describes types of checks and guard plates used. 2500 w. Tram & Ry Wld—April 10, 1913. No. 41755 B.

Tramway Track, 1883 to 1913. F. Bland. Historical account of the methods of track construction, dealing with points and crossings, rail joints and junctions. 2500 w. Elect'n, Lond—June 20, 1913. No. 43373 A.

Tramway Track, 1883 to 1913. Fred Bland. Read before the Tram. & Light Rys. Assn. at Blackpool. A résumé from a manufacturer's standpoint. Ills. Also discussion. 7000 w. Tram & Ry Wld—July 10, 1913. No. 43883 B.

Way Construction of the Connecticut Company. Describes the division of duties between the construction and the way departments in handling the track work. Ills. & Map. 2500 w. Elec Ry Jour—Aug. 30, 1913. No. 44874.

Track Construction. Illustrated account of modern methods of installing track in paved city streets. 9000 w. Elec Ry Jour—Oct. 4, 1913. No. 45714.

Traction

Mechanical Haulage. John Robinson. Read before the Inst. of Munic. Engrs. Explains the conditions in the writer's district and the advantages of mechanical traction. 3000 w. Surveyor—Jan. 24, 1913. No. 39784 A.

Traffic

The Problem of City Traffic and Metropolitan Railways in the United States (Problemi di traffico urbano e ferrovie metropolitane agli Stati Uniti). Renzo Norsa. A study of conditions as found in Boston and New York. Ills. 2400 w. Industria—Mar. 30, 1913. No. 41535 D.

Traffic Methods

Illinois Traction System's St. Louis Express and Freight Traffic Methods. Illustrated detailed description of the methods employed in handling a large express and freight business. 4500 w. Elec Ry Jour—Feb. 15, 1913. No. 39877.

Trolley**Trolley**

Trackless Trolley Installation at Keighley. Harry Webber. Illustrated description of the Cedes-Stoll system adopted and installed. 3000 w. Tram & Ry Wld—Oct. 16, 1913. No. 46239 B.

Trolley Designs

The Development of Current-Conducting Mediums on Electric Railways (Die Entwicklung der Stromzuführungseinrichtungen elektrischer Bahnen). Herr Arns. Illustrates and describes various types of trolley poles used in the history of electric service. Ills. 4400 w. Elek Kraft u Bahnen—Nov. 4, 1912. No. 38472 D.

Trolley Lines

Electric Railway Properties and the Public. Calvert Townley. Shows the short-sightedness of placing so many restrictions that development is retarded. 2200 w. Elec Jour—Oct., 1913. No. 46319.

Specifications for Overhead Trolley Construction. Abstract of the 600-volt overhead construction adopted by the Am. Elec. Ry. Engng. Assn. Ills. 5000 w. Elec Ry Jour—Oct. 18, 1913. No. 46127.

Valuation

A Street-Railway Valuation. Discusses the principles behind Mr. Bion J. Arnold's valuation of the street railway lines of Kansas City, Mo. 5500 w. Eng News—May 22, 1913. No. 42350.

Analysis of the Premises adopted and Methods Used in Determining the Cost to Reproduce New, Together with the Depreciation Thereon of the Physical Property of the Metropolitan System and the Kansas city and Westport Belt Railway of Kansas City, Mo. Abstract from report by Bion J. Arnold, explaining methods followed. 6000 w. Engng & Con—May 28, 1913. No. 42520.

Wiring

Something Along the Line of Physical and Intangible Valuation as Covered by Recent Legislation. Robert B. Rijenberick. Read before the Cent. Elec. Ry. Assn. Discusses features which may involve great injustice. 6000 w. Elec Trac—July, 1913. No. 43812.

Other Elements of Value Than Franchise Values. Clark M. Rosecrantz. Abstract of paper read before the Am. Elec. Ry. Assn. Discusses elements which make up the values of public utilities other than "physical value" and "franchise value." 3500 w. Elec Ry Jour—Oct. 16, 1913. (Daily Ed.) No. 45928.

Warsaw

Warsaw Street Railways (Strassenbahn Warschau). Description of power house, equipment, rolling stock and system. Ills. and Plate. 1700 w. Elek Kraft u Bahnen—Sept. 4, 1913. No. 46089 D.

Westphalia

Electric Railways in the Rhine-Westphalian Industries (Die elektrischen Bahnen in Rheinisch-Westfälischen Industriegebiet). Hans Baswitz. Map of the systems in operation with table of mileage and equipment. 1000 w. Elek Kraft u Bahnen—Sept. 4, 1913. No. 46087 D.

Wheels

Brooklyn Wheel, Axle and Gear Practice. Gives experiences with steel wheels and methods of handling them, axle improvements, betterments in gear and pinion practice, etc. Ills. 5500 w. Elec Ry Jour—Nov. 9, 1912. No. 37369.

Wiring

Parabolical Overhead Wiring for Electric Roads. Owen M. de Munnick. Illustrates modern practice. 1000 w. Sci Am Feb. 15, 1913. No. 39885.

THE ENGINEERING INDEX

Volume I., 1884 to 1891 inclusive, ...	Out of Print
475 pages. Edited and published by The Association of Engineering Societies under the direction of Prof. J. B. Johnson.	
Volume II., 1892 to 1895 inclusive, ...	Out of Print
474 pages. Edited by The Association of Engineering Societies under the direction of Prof. J. B. Johnson, and published by THE ENGINEERING MAGAZINE.	
Volume III., 1896 to 1900 inclusive, ...	\$7.50
1,030 pages. Edited and published by THE ENGINEERING MAGAZINE.	
Volume IV., 1901 to 1905 inclusive, ...	\$7.50
1,234 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1906, ...	\$2.00
412 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1907, ...	\$2.00
450 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1908, ...	\$2.00
460 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1909, ...	\$2.00
490 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1910, ...	\$2.00
528 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1911, ...	\$2.00
530 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1912, ...	\$2.00
520 pages. Edited and published by THE ENGINEERING MAGAZINE.	
THE ENGINEERING INDEX ANNUAL FOR 1913, ...	\$2.00
510 pages. Edited and published by THE ENGINEERING MAGAZINE.	

The monthly continuation of the Index, from the close of 1913, is to be found in the successive issues of The Engineering Magazine.

THE ENGINEERING MAGAZINE CO.

140-142 NASSAU STREET, NEW YORK

THE ENGINEERING MAGAZINE

SPECIALLY DEVOTED TO THE INTERESTS OF

Engineers, Superintendents and Managers

CONTAINING

ORIGINAL ARTICLES—Illustrated

Prepared Exclusively for the Magazine by the Foremost
Engineering Authorities in the World.

EXPERT REVIEWS

of the Most Important Publications Appearing Currently
in the British, American and Continental Press.

THE ENGINEERING INDEX

Covering the Engineering Literature of the World month
by month.

Subscription Price, 25 Cents a Copy, \$3.00 a Year

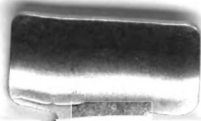
THE ENGINEERING MAGAZINE CO.

140-142 NASSAU STREET, NEW YORK

89094394624



B89094394624A



89094394624



b89094394624a